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# Inaugural Address
ON
# PLAGUE.

*Delivered at the International Plague Conference, Mukden, on April 4th, 1911,*

BY WU LIEN-TEH (G. L. TUCK), M.A., M.D., B.C. CANTAB.,

ASSISTANT DIRECTOR, IMPERIAL ARMY MEDICAL COLLEGE, TIENTSIN, CHINA.

YOUR EXCELLENCY, DELEGATES, LADIES AND GENTLEMEN,—Permit me to express the great pleasure it gives me to accept the appointment as chairman of this International Plague Conference, consisting, as it does, of so many well-known names in the medical and scientific world. I feel very diffident in having to address such an august body, well knowing my poor qualifications, and the only reason I can think of for having this honour thrust upon me is the success of the plague prevention work in Harbin, in which, however, I seem to have had but a small share in comparison with the arduous tasks which fell to my staff of able and willing assistants.

As His Excellency the Imperial Commissioner has remarked, this pneumonic plague sprang upon us suddenly, and despite all our efforts has claimed, up to this date, more than 46,000 victims. It seems that this form of plague is not actually new to Manchuria, as for many years, certainly within the last decade, there have been sporadic outbreaks both amongst Russians and Chinese in Siberia, Mongolia, and Manchuria. There are statements that it raged during the seventeenth century, but so far as can be gathered from really authentic records this is the first extensive outbreak of the exclusively pneumonic variety that has occurred for ages. You may be aware that the epidemic which swept over Newchwang in 1899 was mainly bubonic in character, as also was that which killed over 800 people in Tang Shan in 1908. We are indebted to the Russian doctors for the first accurate information regarding epidemics of pneumonic plague, and as full papers will be read before this conference by our learned Russian colleagues I will pass over that part of the subject and confine myself rather to what little we have been able to discover regarding the present outbreak.

## THE MARMOT AND PLAGUE.

That a certain rodent, the Arctomys bobac, known in English as the marmot, in Russian as the tarabagan, and in Chinese as the han ta, is chiefly associated with this form of plague has for some time been fully believed by the inhabitants of Mongolia and North-Western Manchuria. According to some valuable information gathered by Dr. Chuan, of the medical staff, who was sent up to the station of Manchouriè to report on the subject, it appears that the local people have long been familiar with this disease, both in men and in animals. From the actual marmot hunters themselves he found out some items which, I venture to believe, will exercise an important bearing on our knowledge of the plague.

Nature is very rich in anomalies, and perhaps as scientists, more than any other class of men, you are prepared for such, but who could have dreamed this about the healthy marmot? Basking, as it loves to do, in the warm sunshine, it utters a cry resembling the sound *pu p'a, pu p'a*, which in the Chinese language, at any rate, means "Don't be afraid," or "No harm"? Sickness renders it mute, so in the light of present knowledge it would seem that when the marmot is not crying "No harm, no harm," there is a very real harm indeed. The sickness in the tarabagan, which we presume is the forerunner of the plague, in this case is characterised by an unsteady gait, inability to run or to cry when chased, and when caught the physical signs are seen to consist principally of enlargement of the glands. When noticing the above signs the experienced hunter leaves his quarry severely alone and betakes himself to more distant spheres. During the past few years, however, there has been an exceptional demand for the marmot skins in the European and American markets, and numbers of wandering Shantung coolies have, in consequence, found their way to the marmot resorts, hunting it indiscriminately, and, food being scarce, often cooked and ate the flesh of the marmot. A number of these Shantung men have died in previous years, but not in sufficient numbers to attract attention. The season for killing marmots is from August to the middle of October. About the third week in October of last year there were said to be fully 10,000 of these hunters gathered in Manchuria and Khailar, with their skins, waiting to sell them and then to return south for the winter. Dr. Chuan found out that the symptoms of sickness suffered by these hunters were headaches, fever, and spitting of blood-coloured sputum, followed by rapid death.

The tarabagan, or marmot, has a wide range over the plains and sandy wastes of Mongolia and Central Asia, and now that such attention has been called to its power of infecting human beings with plague we shall learn more about its habits. We know that it hibernates through the winter and awakes fat and strong in the spring, when the younger ones seek new homes in which to breed. The new burrows often run into old "earths," in which it may happen that there may be dead left from a previous season which may infect the new arrivals. The animals that die in the open are probably all devoured by other animals and birds, but it seems that the marmot creeps into its home, as a rule, to die. The inexperienced hunters nearly always dig out the marmots from their holes and thus run more risks than the ordinary Mongol, who generally hunts the marmot in the open or traps it near its abode, thus coming into contact with and catching only healthy animals. Despite the apparent risk however, there are no statistics which show that many hunters die on the plains. But when they are gathered together in the late autumn at the market places, they crowd into very poor hovels or inns, where with piles of raw pelts they may often be found living, sleeping, and eating, from 20 to 40 in the smallest of most badly ventilated rooms; here the conditions are ideal for the encouragement of any epidemic disease.

## PROGRESS OF THE EPIDEMIC.

From Chinese sources we learn that the first case of pneumonic plague reported in Manchuria occurred in the small town of Manchouriè on Oct. 12th, 1910 (6th of ninth moon), but owing to the energetic action of the Russian authorities only about 400 died; the last case reported was on Dec. 25th—i.e., two and a half months after the outbreak. The first cases reported in Harbin were on Nov. 7th (6th of tenth moon), when two tarabagan hunters, who had arrived from Manchouriè, were lodged in the shop of an artesian-well mechanic. These two men died from plague and infected four others with whom they lived. From this time forth the epidemic began to spread rapidly, and Harbin soon earned an unenviable reputation as a plague-distributing centre, from where it spread into Central and Southern Manchuria and far into the northern provinces of Chihli and Shantung.

The following few dates are of interest as showing the rate at which certain centres became infected:—

| | | | |
|---|---|---|---|
| Manchouriè ... | Oct. 12th, 1910. | Hsinmin Fu ... | Jan. 14th, 1911. |
| Tsitsihar ... ... | Dec. 4th, ,, | Chinchou Fu ... | ,, ,, ,, |
| Harbin ... ... ... | Nov. 7th, ,, | Yungping Fu (not on railway) ... | ,, 15th, ,, |
| Hulanho (15 miles from railway)... | Dec. 13th, ,, | Tientsin ... ... | ,, ,, ,, |
| Shuangcheng Fu | Jan. 5th, 1911. | Peking ... ... ... | ,, 2nd, ,, |
| Kuanchengtze ... | Dec. 14th, 1910. | Chefu (by sea from Dalny) ... | ,, 21st, ,, |
| Kirin city (80 miles from a railway) ... ... | Jan. 16th, 1911. | Tsinan Fu ... ... | Feb. 1st–7th, 1911. |
| Mukden ... ... | ,, 2nd, ,, | | |

For the absolute accuracy of the dates I cannot vouch, but they are right within a day or two. It is instructive to see that—1. The plague tended to follow the quickest line of travel. 2. That the lines of infection corresponded exactly with the routes taken by the coolies on their return home for the Chinese New Year. 3. That although Shuangcheng Fu is only about 30 miles south of Harbin, on the Russian railway, the first case reported there was nearly two months after the outbreak in Harbin. When it did appear it was extraordinarily virulent, killing over 4000 people in the whole district in the course of two months. 4. That it spared certain towns—e.g., Newchwang and Chinwang-tao, the latter being the principal winter port of North China. The reason of immunity in the former case appeared to be due to the fact that the town is frost-bound

in winter; in the latter case the cause might be traced to the coolies not traversing the town on their southward march by foot. That Tangshan actually, and Peking and Tientsin practically, escaped might be due to their employing only local coolies in winter, and therefore those homeward bound from Manchuria would not remain in these cities.

### SOME OBSERVATIONS ON PLAGUE INCIDENCE.

As to the main object of this Conference, in the words of His Excellency the Commissioner: "We are determined henceforth to meet this enemy, the plague, armed with the best knowledge we can obtain." I will therefore venture to lay before you for your consideration the following programme of investigation. I would request you to confine your attention as far as possible to the present epidemic, in its pneumonic, septicæmic, and other forms (if such be existent), dealing with the bubonic form so far only as it throws light upon the present outbreak; and I trust that the elucidation of some of the many plague problems at this Conference will enable us more effectually to deal with the disease in the future.

It would be idle on my part at this stage to attempt in any way to deal *seriatim* with the many interesting problems—some of them exceedingly obscure—which have arisen out of this epidemic, but a few observations made whilst I was in Harbin may perhaps be of interest to you. When I first went there many of the inhabitants with whom I conversed informed me that this epidemic was quite an ordinary visitation to which they were quite accustomed. It never killed many, and would stop of itself if no attention was paid to it. From both Russian and Chinese records there is no doubt that the pneumonic form of plague had occurred there before, but why on this particular occasion it should have assumed such a virulent form, killing within the space of three months over 5000 persons in a population of 30,000, I hope you will be able to explain.

Two factors seem to have contributed largely to the virulence of the epidemic in the Chinese city. These were, first, the severe climatic conditions, the thermometer registering at times — 30° C., which extreme cold prevented the people going out-doors; the second factor was the low, dark, dirty, and overcrowded houses which formed the majority of the dwellings. At the same time it is worthy of note that some of the double-storeyed houses, with plenty of air-space and not overcrowded, were also badly infected. One house particularly, a chinaware shop, situated in the largest street, containing eight inmates, including the proprietor, not of the coolie class, one after the other had the plague, until, in the end, not a soul was left to claim the property.

Whilst on this topic I should like to say a few words on the character of the epidemic at Shuangcheng Fu, a city situated 30 miles south, on the railway line from Harbin. As cities are known in China, there could be no greater contrast than between Shuangcheng Fu and Fuchiatien (the Chinese town of Harbin). The latter is closely packed and built on a low-lying, swampy plain, with narrow streets, inhabited principally by coolies; whilst the former (Shuangcheng Fu) is a finely planned city, with wide streets at right angles to one another, some of which are as much as from 80 to 100 ft. broad. This town is famed for its spacious compounds and large, well-constructed houses. There is much open space used by the numerous large inns, bean-mills, distilleries, pawn-shops, &c., and at least half the population is well-to-do, there being but little poverty, and a generally settled people living in families, thus making a very marked contrast to the transitory hand-to-mouth multitude that forms so large a section of Fuchiatien. About half of the families of Shuangcheng Fu are Manchus, many of them wealthy landowners, who, with the leading Chinese merchants, are very clean in their habits and homes. Yet there were 1500 deaths in this city of about 60,000 within the space of seven weeks. I cite this to show that there may be other reasons, as well as dirt and poverty, to account for the fierce mortality.

Turning to the subject of statistical data, full tables will in time be handed to you for your consideration. It is interesting to note that where records have been kept the age of greatest susceptibility is from 20 to 40 years. In Fuchiatien less than 100 women died out of a total of over 5000 deaths, whilst in Shuangcheng Fu nearly 500 out of 1500 lost their lives. This is explained by the fact that in Fuchiatien there are almost no females, whilst in Shuangcheng Fu a large part of the population is made up of families.

This epidemic found us at the beginning relying on many of the data of bubonic plague, relating to prevention and treatment, but the results of our experience at Fuchiatien have tended to modify our early expectations as to the efficacy of the vaccines and serums, procured by us. Another fact, perhaps, worthy of notice is that in Mukden alone 13,000 rats have been examined, besides large numbers in other centres, under the Chinese administration, without showing any signs of plague. It might be suggested, therefore, that few, if any, have been infected; yet in Harbin the unusually large number of deaths amongst domestic animals, as also the deaths of about 400 horses and 300 pigs, might suggest the possibility of a similar epidemic infection. I regret deeply that the amount of work in hand at the time when the epidemic was raging was so enormous, while our number of assistants was so limited, that it was impossible for us to collect positive scientific facts upon this interesting subject.

The question of natural immunity forced itself upon our consideration. There were several instances of plague hospital assistants and attendants in hospitals, where scores were dying daily under our notice, who worked right through the epidemic, even though the precautions taken by them were of the slightest character and for long periods non-existent.

### QUARANTINE AND DISPOSAL OF THE DEAD.

Two items of interest which proved their utility during the Harbin outbreak, in such a manner as to have an important bearing upon any future epidemic, may be alluded to. First, the use of railway wagons for quarantine work, and, secondly, the disposal of the dead bodies by burning. The ease with which a railway wagon, holding at the most not more than 20 persons, enables a segregation camp to be divided into small units, completely isolated from each other, also the simplicity of disinfection, the early detection of suspects, the satisfactory ventilation by small windows and sliding doors, and the heating by a central stove, suggest at once a most efficient form of quarantine which can be quickly established at any place in proximity to a railway. The second—viz., the burning of the dead—which though not unheard of in Chinese annals still conjures up in the native mind all that is repulsive and contrary to natural feelings, yet once decided upon by the Government was accepted by the people without complaint or hindrance. At a time when severe frost made burial almost impossible burning, by its ease and simplicity, commended itself to all of us. A pit, 20 ft. square and 10 ft. deep, which had been blasted by dynamite, was capable of holding 500 bodies at a time. When bodies were in coffins the wood of the coffins was sufficient for complete burning, but bodies without coffins required at the rate of four pieces of wood, 2 ft. long by about 4 in. in diameter, for each body, and upon the whole mass, in the pit, kerosine oil was pumped from a fire-engine, at the rate of 10 gallons to every 100 bodies. This when lighted burned so rapidly and fiercely that little or nothing remained but ashes. The example of Fuchiatien in this respect was afterwards followed by neighbouring towns, and the process has proved to be a satisfactory means for the disposal of dead bodies in all large epidemics. Such an action on the part of the Chinese Government in dealing with the great problems of the plague, and their permission to conduct post-mortem examinations on unclaimed bodies for the further investigation of the disease, granted for the first time in the history of China, must prove to you that the Government is moved by the highest motives of humanity, and is ready to lay aside age-long prejudices, to spend money unsparingly, and to possess itself of all that science can impart for the saving of life and elimination of national perils.

In closing, may I remind you that this is the first International Medical Conference held in China, and the widespreading effect of it is impossible to estimate. Besides the beneficial results of your observations and resolutions on the subject of the plague, the impulses you will set in motion by the fact of this Conference will react, not only upon the national life, but more particularly upon that of the future progress of medical science in China. I feel deeply the burden of the honour placed upon me in being chairman of this Medical Conference, which is unique in our history, powerful in its representation, and which gives China a strong position amongst nations seeking the welfare of the people.

# The Goulstonian Lectures

ON

# THE SENSIBILITY OF THE ALIMENTARY CANAL IN HEALTH AND DISEASE.

*Delivered at the Royal College of Physicians of London on March 14th, 16th, and 21st, 1911,*

BY ARTHUR F. HERTZ, M.A., M.D. OXON., F.R.C.P. LOND.,

ASSISTANT PHYSICIAN AND PHYSICIAN IN CHARGE OF THE DEPARTMENT FOR NERVOUS DISEASES, GUY'S HOSPITAL.

## LECTURE II.[1]

*Delivered on March 16th.*

### IV. THE SENSATION OF FULNESS AND DISTENSION (*continued*).

MR. PRESIDENT AND GENTLEMEN.—3. *The sensation of fulness in the intestines.*—I have had no opportunity of investigating the sensation of fulness in the small intestine experimentally, but Mr. Digby and I have made numerous observations on the colon by introducing the apparatus I have already mentioned in connexion with the œsophagus through a colostomy opening. The results obtained can probably be applied to the small intestine.

As soon as the sensation produced in the abdominal muscles by the introduction of the instrument into the colon had disappeared we inflated the balloon. When a certain internal pressure was attained, a sensation described by the patient as "fulness" or "wind" was felt. In our earliest experiments we did not use a manometer, and we were thus unable to estimate the pressure which was being exerted on the intestines; in two patients inflation produced no sensation, but this was doubtless due to the pressure being insufficient, as we did not like to inflate the bowel to any considerable degree without knowing how great a pressure we were exerting. These experiments show that the sensation of fulness in the intestines is due, as in the case of the stomach, to tension on the muscular coat.

Three of our patients tried to eructate during the experiment with the object of getting rid of the flatulence which they thought was present. This shows how difficult it is to recognise the source of the sensation. It is always felt at a lower level in the abdomen than that due to gastric distension, but its character is so similar that a patient, who is aware of the relief sometimes afforded by eructation to the sensation of fulness in the stomach, hopes to obtain by this means the same relief, although the sensation is produced by distension of his colon.

Before concluding that the sensation of fulness felt in our experiments was produced in the viscera themselves, it was necessary to exclude the possibility that it resulted from stretching of the peritoneal attachment of the bowels or from pressure on the anterior abdominal wall. This was done by observations on a patient with a prolapse of 2½ inches of his pelvic colon through the gap left by the removal of the sacrum in the performance of Kraske's operation for excision of the rectum. Although pinching produced no sensation, distension of the exposed intestine by a balloon, whilst its attachment was kept relaxed, at once caused a sensation of "wind" to be felt below the umbilicus.

In several experiments on other patients a finger was introduced through a colostomy opening; after the initial discomfort caused by the stretching of the gap in the abdominal wall had subsided the tip of the finger was bent so as to press through the intestine upon the anterior abdominal wall sufficiently to produce a distinct prominence. In the majority of cases nothing was felt, thus proving that mere pressure from within on the structures of the anterior abdominal wall is not the cause of the sensation of fulness in the abdomen. Even squeezing the abdominal wall between one finger inside and one outside produced nothing more than a local sensation in the muscle and skin of the abdominal wall. In two cases, however, a sensation of fulness and pain was produced by slight and strong pressure respectively; as this was inconstant it may have been due to the tension exerted on the muscular coat of the bowel, as the descending colon, which was the part of the bowel involved, is fixed posteriorly.

The muscular coat of the intestines undergoes variations in tone as great as those of the muscular coat of the stomach. This is well seen in the colon, a part of which, when empty, can often be felt as a contracted cord, indicating that its lumen is almost completely obliterated. Some hours later, when fæces and gas are traversing it on their way to the pelvic colon, its diameter may be 3 cm. or more. The tension exerted by the intestinal contents on the muscular coat is under normal conditions the same whether the bowel be empty and contracted or full and dilated, as the passage of fæces and gas is sufficiently slow to allow the tone to diminish *pari passu* with the increase in their volume. Distension is the most important stimulus of peristalsis, but the adequate tension for the production of peristalsis is lower than that for the production of sensation, as although peristalsis is constantly produced in this way, it is normally never associated with any sensory manifestation. When, however, excessive bacterial decomposition occurs in the intestine, the production of gas may be so rapid that the relaxation of the intestinal tone is unable to keep pace with it, and the intra-colonic pressure rises sufficiently to produce a sensation of fulness. This rarely amounts to more than a vague sensation of abdominal discomfort so long as the lumen of the bowel remains unobstructed, as the gas can pass onwards without difficulty to be expelled as flatus per anum. If, however, the expulsion of gas is voluntarily restrained, the further rise of tension results in a sensation of fulness, which is instantaneously relieved when flatus is allowed to escape. A more common cause of the sensation of fulness is obstruction to the lumen of the bowel. In constipation temporary obstruction by a hard mass of fæces, upon which the colon has firmly contracted, often occurs; although bacterial decomposition is generally not increased in constipation, the gas normally produced may cause distension, as its onward passage is delayed. In organic obstruction the distension and its sensory results are much more marked, as the production of gas by fermentation and putrefaction is then frequently excessive, and the obstruction prevents its passage into the more distal parts of the bowel.

I have recently seen two patients, upon whom gastro-enterostomy had been performed respectively nine and three years previously, in the one case for cicatricial pyloric obstruction and in the other for duodenal ulcer. They were both relieved of their old symptoms, but complained of a disagreeable sensation of fulness immediately above the umbilicus during and directly after every meal, unless they ate very little and very slowly. Both were now supposed to be suffering from atonic dilatation of the stomach. Examination with the X rays showed, however, that the stomach was small and hypertonic; the stoma was so large that food could be seen to run through it with such rapidity that the stomach was almost empty a quarter of an hour after half a pint of porridge with 2 oz. of bismuth oxychloride had been eaten. The rapid distension of the jejunum, which is never distended under normal conditions, was probably the cause of the sensation of fulness, as its diameter was seen by the X rays to be unusually great. This explanation is confirmed by the situation of the sensation, which was lower than that due to gastric distension and corresponded to the upper limit of the situation of the pain felt when the small intestine is subjected to rapid distension.

4. *Fulness in the rectum and the call to defæcation.*—Owing to the tonic contraction of the rectum and the acute angle formed at the pelvi-rectal flexure, the further passage of fæces is obstructed at this point. Consequently, as O'Beirne[2] was the first to show, the pelvic colon becomes filled with fæces from below upwards, and the rectum remains empty until immediately before defæcation. This process of accumulation in the pelvic colon is normally unaccompanied by any sensation, but if an excessive quantity collects owing to obstruction at the pelvi-rectal flexure, discomfort and subsequently pain are felt just above the pubes.

In individuals whose bowels are opened regularly every morning after breakfast, the entry of fæces into the rectum gives rise to the sensation of fulness, which leads to the desire to defæcate and may be termed the call to defæcation. The passage of fæces from the pelvic colon into the rectum is

[1] Lecture I. was published in THE LANCET of April 22nd, p. 1051.

[2] James O'Beirne: New Views of the Process of Defecation, Dublin, 1833.

the result of active peristalsis in the former, brought about reflexly by various stimuli, the chief of which is the taking of food at breakfast into the empty stomach. The same effect is produced by a cold bath, by the muscular activity involved in getting up and dressing, and by drinking a glass of cold water before breakfast.

The insensibility of the rectum to tactile and chemical stimulation shows that the call to defæcation cannot be due to the mere contact of fæces with the rectal mucous membrane. From analogy with the effect of distension in other parts of the alimentary canal it seemed to me that the sensation of fulness in the rectum would probably also be due to its muscle-sense. Observations carried out at different times with Mr. Barber and with Mr. Digby have proved that this view is correct. On introducing an indiarubber balloon, connected with a pump and manometer through a sigmoidoscope into the pelvic colon immediately above the pelvi-rectal flexure, slow inflation produced a sensation of fulness in the middle line a little above the pubes, but never in the back. When, however, the rectum immediately below the flexure was inflated, the sensation was no longer felt in front, but in the rectum or in some individuals in the neighbourhood of the sacrum, and when the lower part or ampulla of the rectum was inflated the sensation was always felt in the rectum itself. Whichever part of the rectum was inflated the sensation produced was always accompanied by a desire to defæcate, being in fact identical with the natural call to defæcation. The minimal pressure required to produce a sensation is greater in the pelvic colon than in the upper part of the rectum, and greater in the latter than in the ampulla; in one individual, for example, the adequate pressures were 110, 85, and 50 mm. of mercury just above the flexure (18 cm. from the anus), just below the flexure (12 cm. from the anus), and in the ampulla of the rectum (8 cm. from the anus) respectively.

Owing to the sudden change in the localisation and character of the sensation produced by distension when the pelvi-rectal flexure is passed, the entrance of fæces into the upper part of the rectum at once produces the call to defæcation; this increases in intensity as more fæces enter and as the most advanced portion reaches and distends the more sensitive ampulla. If the rectum were the part of the bowel in which the fæces collected, as has frequently but erroneously been stated, the regular return of the desire to defæcate each morning would be impossible, for there would be no sudden entry of fæces, such as is necessary to produce the increase in tension which acts as the adequate stimulus for the call to defæcation.

As the specific sensation, which I have designated the call to defæcation, is peculiar to the rectum, it is never experienced after excision of the rectum. This was well seen in a patient from whom Mr. R. P. Rowlands had removed the whole rectum from below, the end of the pelvic colon having been brought down through the sphincter ani and joined to the skin at the anal margin. The patient stated that he had never felt the ordinary call to defæcation since the operation; he attempted to open his bowels regularly, as he knew that it was best for him to to do so, but he only recognised that there was anything to expel by the occurrence of a feeling of tightness just within the anus, when the fæces began to leave the rectum. Mr. Barber and I found that distension of the bowel immediately above the sphincter caused a sensation of fulness or pain according to the rapidity of inflation; in both cases it was felt just above the pubes, and there was no rectal sensation of any kind. The adequate pressure was approximately the same as in our experiments on inflation of the pelvic colon of normal individuals through a sigmoidoscope. On placing the balloon so that it was grasped by the sphincter ani and then inflating it, the sensation which the patient was accustomed to feel when his bowels began to open was experienced. Exactly the same results were obtained in the case of a woman from whom Mr. Rowlands had removed 6 inches of the pelvic colon and the whole rectum by the abdomino-anal method.

The intra-rectal pressure, which is adequate to produce the call to defæcation, is constant for each individual. It amounted in different individuals examined under exactly similar conditions to 50, 54, and 58 mm. of mercury. When the inflation was rapid the first sensation was produced at a slightly lower pressure. Whatever the rate of inflation the urgency of the call to defæcation increased as the intra-rectal pressure rose. As soon as the inflation was discontinued, the pressure began to fall and the desire to defæcate became less urgent and finally disappeared. When the intra-rectal pressure was just sufficient to produce a minimal sensation, the latter disappeared in less than half a minute, the pressure having gradually fallen about 4 mm. After the sensation had disappeared there was no further fall in pressure. On now pumping more air into the balloon the pressure rose; as soon as it reached the height at which the call to defæcation was first experienced, the latter returned, but gradually disappeared as the pressure fell once more. A similar waxing and waning of sensation and intra-rectal pressure was observed several times without allowing any air to escape. It is clear that the size of the balloon required to exert an adequate pressure on the rectal wall steadily increased. This could only result from relaxation of the tone of the rectum, an occurrence which is strictly analogous to what has already been described in connexion with the stomach and intestines.

If a response is not at once made to the call to defæcation, the desire to defæcate passes away; it has generally been supposed that this was due to the fæces being carried back into the pelvic colon by antiperistalsis. The observations of Tuttle[3] had previously convinced me of the error of this view, an error which is at once obvious if digital examinations be made at any time after the desire to defæcate has passed away, as fæces are always found in the rectum. Our experiments show that the true explanation is the relaxation of tone, which occurs in the muscular coat of the rectum after it has been subjected to a certain degree of tension for a short period. The call to defæcation only returns after a further quantity of fæces has entered the rectum and produced a rise in intra-rectal pressure. This may occur after any meal, but most frequently only after breakfast on the following morning.

Further observations proved that the minimal pressure required to produce the call to defæcation diminished as the length of the balloon increased. Thus in one individual the pressure was 48, 38, and 32 mm. of mercury respectively with balloons 4½, 5½, and 7½ cm. long. Thus the urgency of the call to defæcation varies with the length as well as with the diameter of a mass of fæces, and the efficacy of an enema depends upon the length of bowel stimulated as well as upon the degree of its distension. Although a large mass of fæces produces a greater desire to defæcate than a small mass at any given moment, it is quite impossible to estimate the quantity of fæces present in the rectum with any accuracy from the strength of the sensation. For the tone varies greatly from time to time; a small mass will on one occasion be sufficient to produce the adequate intra-rectal tension, whereas on another occasion a mass double the size may have no effect.

As a result of my investigations with the X rays on the motor functions of the intestines in health and disease I concluded that all cases of constipation can be divided into two classes: in the first, which may be called *intestinal constipation*, the passage through the intestines is delayed, whilst defæcation is normal; in the second class, for which I have adopted the term *dyschezia*, there is no delay in the arrival of the fæces in the pelvic colon, but their final expulsion is not adequately performed.

The most common cause of dyschezia is the habitual disregard of the call to defæcation, either on account of ignorance or laziness, or fear of pain in diseases of the anus and the neighbouring organs. I have already described how the sensation of fulness in the rectum passes off owing to relaxation of the tonic contraction of its muscular coat if the call to defæcation be disregarded. If it is again disregarded after its return on the arrival of more fæces in the rectum, further relaxation occurs. More and more fæces accumulate in the rectum, the muscular coat of which becomes more and more relaxed. As the force required to empty the rectum when over-distended with fæces is much greater than that required to empty it under normal conditions, evacuation is now likely to be incomplete, even if a great effort be made. Consequently fæces are constantly present in the rectum instead of only for a few minutes before defæcation, and the lumen of the rectum is permanently increased owing to the atony of its muscular coat. It has sometimes been recommended that patients who are constipated as a result of irregularity in

[3] J. P. Tuttle: Diseases of the Anus and Pelvic Colon, p. 523, London, 1903.

their habits should attempt to open their bowels after breakfast, but should not obey the call to defæcation if felt at other times of the day. Our observations show that this teaching is wrong, and that in addition to the regular morning effort a response should be made to every call, however inconvenient the time. For the occurrence of a call to defæcation always means that for some reason fæces have just passed from the pelvic colon into the rectum; the relaxation of tone which follows neglect of the call is undesirable, particularly in patients with dyschezia, in whom a certain degree of atony is already present.

Dyschezia may be due to various other causes, such as weakness of the voluntary muscles of defæcation and the assumption of an unsuitable position during defæcation. But whatever the primary cause, the final result is the same. The incomplete evacuation of the rectum results in the accumulation of fæces and in atonic dilatation of the rectum.

I believed at first that the absence in dyschezia of any sensation when the rectum contained fæces was due to a blunting of the sensibility of the mucous membrane as a result of the irritation produced by the constant presence of fæces. This view was found to be erroneous by our observations that the rectal mucous membrane is normally insensitive to tactile stimulation, and that the call to defæcation depends upon the sensibility of the muscular coat of the rectum. The few experiments which I have at present had the opportunity of making suggest that the muscular sense is not impaired in most cases of dyschezia, as the intra-rectal pressure required to produce the call to defæcation is not greater than in normal individuals. The dyschezia depends upon the atonic dilatation of the rectum, an abnormally large quantity of fæces being required to exert the normal adequate pressure. In extreme cases a blunting of the muscle-sense may also occur; in such cases the rapid and considerable distension produced by an enema injected with an ordinary syringe fails to produce the artificial call to defæcation, which in most cases of dyschezia results in a movement of the bowels.

There is, however, an entirely distinct class of dyschezia, which depends upon deficiency of the muscle-sense of the rectum. Congenital deficiency probably causes the dyschezia, which occurs not uncommonly in infants, in whom the slight additional distension produced by the introduction of a finger or a piece of soap into the rectum results in an adequate stimulus. In the majority of cases the muscle-sense develops when the infant grows older, but occasionally this may be the starting-point of dyschezia which lasts throughout life.

The rectal muscle-sense is completely abolished in diseases of the spinal cord, in which the defæcation centre itself or the fibres connecting it with the brain are involved. I have found by means of the X rays that the severe constipation which occurs in these cases is due to dyschezia, as the rate of passage through the colon is unaffected.

The nerve fibres, which convey afferent impulses from the intestinal muscles, appear to ascend the posterior columns of the spinal cord along with those from the voluntary muscles, as observations made with Mr. Barber on nine consecutive cases show that the degeneration of the posterior columns which occurs in tabes always results in some alteration in the muscle-sense of the rectum. Thus in three cases in which constipation was a constant and marked symptom and in one in which constipation was only occasionally present, the pressure required to produce the call to defæcation was double or more than double that required in normal individuals examined at the same time with the same apparatus. In two tabetics, whose bowels were opened several times every morning, the pressure was about normal and in one it was unusually low. But in all of the nine cases the sensation lasted for a much longer period after the pressure was relaxed or the balloon removed than in normal individuals; the duration varied between 25 seconds and 6 minutes, whereas normally the sensation always disappears under similar conditions within 5 seconds. The duration was longest in the patients who complained of morning diarrhœa; one of these opened his bowels six or seven times every morning within a period of an hour and a half, a small solid stool being passed each time; he had, however, found by experience that he could terminate this annoying desire to defæcate by ignoring it and going out-of-doors, when it gradually disappeared. This so-called morning diarrhœa, which is not uncommon in tabes, is thus probably due to the excessive duration of the sensation of fulness felt in the rectum after the stimulus which produced it has ceased to operate. Finally, in five out of the nine cases the call to defæcation only occurred after a latent period of a few seconds instead of instantaneously as in normal individuals.

We may conclude that *the ill-defined sensations which occur in all parts of the alimentary canal, and which may be grouped together as "the sensation of fulness," are due to stretching of its muscular coat and constitute a form of muscle-sense*, which is probably shared by all hollow viscera. For each part of the alimentary canal a certain tension, which varies in different individuals, is required in order to produce the first trace of sensation. As the tone of the muscular coat, except in the case of the œsophagus, varies greatly under different circumstances, the volume of contents necessary to produce the adequate tension is as variable as the tension is constant. The relative sensibility of different parts of the alimentary canal to distension cannot be ascertained with any degree of accuracy, as the minimal pressure is greater the smaller the area subjected to the tension, and it is experimentally impracticable to apply pressure to an equal area of the wall of the œsophagus, stomach, and intestine. Thus the comparatively low pressure required to produce a sense of fulness in the stomach is doubtless due to the fact that the whole of the stomach was inflated and not merely a small segment as in the case of the œsophagus and intestine. Similarly the pressure required to produce a minimal sensation in the colon was less when a large area was inflated through an open rectal tube than when a limited area was distended by means of a balloon. It may, however, be said that the œsophagus is more sensitive than any part of the intestine except the rectum; that the upper part of the rectum is more sensitive than the pelvic colon, and the sensibility of the rectum increases as the anus is approached.

It may further be concluded that the call to defæcation is a specialised form of visceral muscle-sense. It is the result of the pressure exerted on the rectal wall by the fæces on their entry from the pelvic colon, the urgency of the call depending upon the tone of the circular muscle fibres of the rectum at the time and the bulk and consistence of the fæces.

### V. THE SENSATION OF EMPTINESS AND HUNGER.

In 1836 Tiedemann[4] published an admirable analysis of the sensation of hunger; with the exception of a thesis published in 1892 by Nicolai,[5] I have been unable to find any material contribution to the subject in the last 75 years. Tiedemann pointed out that hunger consists of two distinct sensations—the local sensation of emptiness in the stomach and the general sensation of malaise and weakness in the body as a whole. He believed that the former is due to an increased irritability of the sensory nerves of the stomach, arising in a similar manner to the irritability of the nerves of special sense, which occurs when they have remained unstimulated for a certain period. On the other hand, he ascribed the general sensation to the effect of starvation on the blood, the altered condition of which reacts on the tissues of the whole body and especially on those of the nervous system.

The local sensation of hunger only occurs in man when the stomach is empty. Nicolai showed, however, that emptiness cannot be the only factor in its production, as it is often not felt until several hours after every trace of a meal has passed through the pylorus. He found, moreover, that if the stomach was washed out before it was quite empty hunger was only experienced between two and three hours later.

The gastric constituent of the sensation of hunger can, I believe, be explained most satisfactorily in the light of observations made on dogs by Boldirev in Pavlov's[6] laboratory. He found that periods of motor activity, in which the movements are more energetic than those which take place during digestion, occur at intervals in the stomach and intestines of fasting animals. That the production of hunger should be in some way connected with these spontaneous movements is suggested by the frequent production of borborygmi, which indicate the occurrence of peristalsis,

[4] N. Tiedemann: Physiologie des Menschen, Band iii., 22, Darmstadt, 1836.

[5] W. Nicolai: Ueber die Entstehung des Hungergefühls, Inaugural Dissertation, Berlin, 1892.

[6] I. P. Pavlov: The Work of the Digestive Glands, English translation by W. H. Thompson, second edition, p. 191, 1910.

when hunger is experienced. Under ordinary conditions the gastric and intestinal movements are unfelt. But the production of some slight sensation could be explained if we accepted Tiedemann's theory that the local sensation of hunger depends upon an increased excitability of the sensory nerves of the stomach, analogous to the hyperexcitability of the special senses after prolonged rest. Tiedemann's theory, as originally propounded by him, is insufficient, as the special senses only show their hyperexcitability when they receive their natural stimulus, whereas the sensation of emptiness is present before the sensory fibres of the stomach are stimulated by the consumption of food, the first effect of the latter being to cause the sensation to disappear. As during hunger the spontaneous gastric movements are unusually strong, they would probably give rise to some sensation if the afferent nerve fibres of the muscular coat of the stomach were in a condition of hyperexcitability. This theory accounts for the remarkable manner in which the sensation of emptiness waxes and wanes, as it would only be present during the periods of peristaltic activity. The immediate disappearance of the sensation on taking food is explained by the observation of Boldirev, that the spontaneous movements in the dog cease when it sees or eats food.

Humboldt tells how in times of flood, when food was scarce, the Otomacs living on the banks of the Orinoco ate daily about a pound of earth, which was moulded into large balls and then baked, in order to satisfy the pangs of hunger. It is also related that earth has been consumed on various occasions in war-time when food was unobtainable. The relief experienced can be satisfactorily explained by our theory, as the entrance of indigestible material into the stomach would result in the cessation of the movements, and the distension of the stomach would cause its hyperexcitability to disappear. The temporary relief of hunger produced by drinking water can be similarly explained.

These facts are of practical importance in the dietetic treatment of obesity. Big eaters look for a sense of fulness after meals, and are unsatisfied by a smaller volume of food than that habitually consumed, even if it has an equal or greater energy value; conversely they are satisfied with food of smaller energy value if its bulk is unaltered. Consequently bulky non-nutritious food forms an important part of the diet for the obese.

The feeling of emptiness in the stomach is much more marked six hours after breakfast than after a fast of 12 hours, which include the night's rest, although the stomach in the latter case has been empty for a longer period. This is probably due to the fact that muscular activity increases the tendency to spontaneous movements of the empty stomach. Thus it is not an infrequent occurrence for hunger, which is absent on waking in the morning, to be felt during and immediately after a cold bath, and still more strongly after a brief period of exercise taken before breakfast.

In all records of voluntary starvation for long periods hunger is described as increasing in severity for a time, after which it gradually diminishes and finally disappears entirely. A very graphic description of the results of starvation was written by Antonio Vitali, a magistrate under the First Republic, who was condemned to death, but decided to die from starvation so as to escape the ignominy of execution. He died 27 days after his fast began, but for several days before this all discomfort had disappeared. Two days before the end he wrote[7]: "La faim ne me tourmente plus. La soif a complètement cessé. L'estomac et les intestins sont tranquilles. La tête sans nuage; la vue claire; en un mot un calme universel règne non seulement dans mon cœur et dans ma conscience, mais encore dans tout mon organisme." Corresponding with this, it may be assumed that the movements of the empty stomach increase at first, but as the condition of the nervous system becomes more and more depressed for want of nutrition the movements gradually diminish and finally cease.

Perhaps the contracted condition of the abdominal muscles, which may in extreme cases give rise to a scaphoid shape of abdomen, assists in the production of the sense of emptiness just as the stretched abdominal wall may be a factor in the production of the sense of fulness.

Section of the vagi in animals does not, as a rule, result in any diminution in appetite, the quantity of food taken after the operation being sometimes indeed excessive (Leuret and Lassaigne, Sédillot[8]). This is probably due to a diminution in the sense of satiety; it does not prove that the local sense of hunger is unaffected, as food continues to be taken even when the sympathetic as well as the vagal nerve-supply to the stomach is divided, the general sensation of hunger apparently remaining unaltered in both cases.

It is easy to prove that the whole of the sensation of hunger does not consist in the local sensation of emptiness. When an individual has starved for a prolonged period, a small quantity of food or water is sufficient to overcome the local discomfort, and it does this so quickly that it is clear that the relief depends upon the filling of the stomach alone, as insufficient time elapses for any appreciable quantity to be absorbed. But the general feeling of malaise remains, a much larger quantity of food being required to satisfy the hunger of the starved tissues than that of the empty stomach. For the former digestible and nutritious food is required, for the latter bulk is of primary importance. This is well seen in patients with a fistula of the upper part of the small intestine. Tiedemann had heard of such cases, and I have myself observed one. The patient was constantly hungry, although he ate enormous quantities of food. His stomach always felt full, but the general sensation of hunger remained, as most of the food escaped from the fistula with the result that the tissues continued to be starved. Relief can only be obtained in such cases by introducing food into the intestine through the distal opening of the fistula.

Two classes of anorexia may be distinguished. In the one due to gastric disorders, such as chronic gastritis, the sensation of hunger, both local and general, is absent, and the allied but distinct sensation of appetite is also lost. In such conditions the absence of the local feeling of hunger may be due to absence of the spontaneous movements of the empty stomach owing to the local disease. In the other class of anorexia, due to a depressed condition of the central nervous system, such as occurs in neurasthenia and many other disorders, the general sensations of hunger and appetite are lost, but the local sensation of emptiness may remain unaltered. A very small quantity of food is, however, sufficient to allay the uncomfortable feeling of emptiness; as the general sensation of hunger, which in normal individuals would lead to more food being taken, is absent, nothing more is eaten.

The sensation of emptiness experienced during a period of starvation appears to be partly situated in the intestines as well as in the stomach, and the vague uncomfortable sensation felt after the bowels have been unusually completely emptied by a purgative or an enema at a period when the small intestines are empty is in part constituted by a feeling of emptiness, which is most adequately relieved by a good meal. The sensation of emptiness in the intestines can, like the corresponding sensation in the stomach, be best explained as a result of periodical motor activity in an organ, which is abnormally excitable as a result of the absence of the normal stimuli for an unusually long period. The borborygmi, which are heard when hunger is felt, appear to originate chiefly in the small intestine; they are doubtless produced by peristalsis acting upon the mixture of gas with the digestive juices, which Boldirev showed are spontaneously secreted during the periods of motor activity.

## VI. PAIN.

Although as long ago as 1753 Haller[9] had failed to obtain any evidence that the pleura, peritoneum, lungs, liver, spleen, or kidneys of animals were sensative to pain, it has until recent years been regarded as self-evident that the sensory phenomena of disease could only be explained on the assumption that the viscera were well supplied with nerve fibres, which could convey impulses leading to the sensation of pain. Since the introduction of the method of performing colostomy in two stages, the fact that the manipulation and cutting of the colon during the second stage of the operation, which is performed without an anæsthetic, produced no sensation of any kind first threw doubt upon this view. This doubt was much strengthened by the observations of Lennander[10]

[7] Quoted by G. H. Roger, "Alimentation et Digestion," p. 131, Paris, 1907.

[8] Quoted by H. Milne Edwards, Leçons sur la Physiologie, vol. xiii., p. 492, 1878.

[9] A. v. Haller: Opera Minora, vol. i., p. 356, in the edition published at Lausanne, 1763.

[10] K. G. Lennander: Centralblatt für Chirurgie, Band xxviii., p. 209, 1901 (first paper); and Journal of the American Medical Association, vol. xlix., p. 836, 1907 (last paper). Vide also E. Nyström: Mittheilungen aus den Grenzgebieten der Medizin und Chirurgie, Band xxi., p. 125, 1910.

and James Mackenzie.[11] Lennander found on numerous occasions during operations, performed on human beings after subcutaneous injection of cocaine without a general anæsthetic, that the normal stomach, small intestine, colon, and appendix could be touched with cold or hot objects, burnt with a caustic, clipped with forceps, or cut with a knife without producing any sensation. The inflamed intestine and the exposed mucous membrane of the cæcum were equally insensitive. The other abdominal viscera and the mesentery and omentum were also insensitive, but the parietal peritoneum and subserous connective tissue were very sensitive to painful stimuli, slightly to excessive heat, but not to cold or pressure. This sensibility was greatly increased even by a slight degree of inflammation. Lennander was therefore led to formulate the theory that all pain in visceral disease results from inflammation of, or traction on, the parietal peritoneum and its subserous connective tissue. The latter is richly supplied with fibres from cerebro-spinal nerves, which can, according to Lennander, convey pain, whilst the viscera themselves are supplied only by the autonomic nervous system, which is not, according to him, able to do so. He believed, for example, that colic is due to the pull exerted by the distended intestine above an obstruction on its mesentery, or where no mesentery is present, on the parietal peritoneum to which it is attached. Subsequently he added as another possible cause of colic the pressure exerted on the anterior abdominal wall by the erection of a coil of intestine in a condition of tetanic contraction, such as occurs above an obstruction.

Observations similar to those of Lennander were made during operations by James Mackenzie, but many of his patients had not even a local anæsthetic. He agreed with Lennander that pain never originates in the viscera themselves, and he showed that the parietal peritoneum, which Lennander had regarded as a very sensitive structure, is really as insensitive as the visceral peritoneum, its apparent sensibility being due to the extremely sensitive subperitoneal tissue. But Mackenzie rejected Lennander's theory in favour of one which he had already suggested nine years before the appearance of Lennander's first paper.[12] He believes that stimuli reaching the central nervous system from diseased viscera cause no sensation themselves, but produce an irritable focus in the spinal cord, with the result that the normal afferent impulses reaching it from the muscles and other tissues supplied by this spinal segment give rise to painful impressions, which are referred to the peripheral tissues.

Although Mackenzie was the first to suggest that all pain in visceral disease is really felt in superficial structures, the idea of referred pain was not new. In the first edition of his "Lectures on Rest and Pain," published in 1863, Hilton[13] discussed the origin of the "sympathetic pain," which he described as occurring on the surface of the body in association with derangements of internal and often remotely situated viscera. He suggested that the superficial pain is due to some central connexion of the visceral sympathetic nerves with the peripheral sensory nerves, a connexion which was subsequently more closely studied by Verdon.[14] The following year a paper was published by Lange,[15] which foreshadowed much of the subsequent work of Ross, Head, and Mackenzie, but as it appeared in Danish it was completely neglected. Lange expressed his belief that the pain which occurs in diseases of internal organs is chiefly reflex, being localised in external parts, where it is often associated with cutaneous hyperæsthesia. He suggested that the afferent impulses from the viscera pass to the spinal cord, from which they radiate along sensory tracts to the abdominal wall, to which the mind projects the sensation. In 1888 Ross[16] investigated the question afresh and came to the conclusion that two forms of pain—splanchnic and somatic—occur in visceral disease. He explained the existence of somatic pain in much the same way that Hilton had explained it under the name of sympathetic pain; impulses produced by irritation of the peripheral terminations of the splanchnic nerves are conducted by the posterior roots to the posterior horns of the spinal cord, where they "diffuse to the roots of the corresponding somatic nerves and thus cause an associated pain in the territory of distribution of these nerves." Subsequently Head[17] and James Mackenzie further developed these ideas, and as a result of their investigations the conception of referred pain—the sympathetic pain of Hilton and the somatic pain of Ross—became generally accepted. Head studied particularly the areas of cutaneous hyperalgesia occurring in visceral disease and showed that they are identical with the areas, which receive their sensory nerve fibres from the spinal segments, to which the afferent fibres from the diseased viscera pass. Mackenzie demonstrated that in visceral disease the muscles and parietal subperitoneal tissue supplied by the corresponding spinal segments are tender as well as the skin, and he came to the conclusion already mentioned that all pain in diseases of the abdomen originates in peripheral structures, in contrast to Ross, who believed in splanchnic (or visceral) and somatic (or referred) pain, and to Head, who believes that the viscera are endowed with "deep and protopathic sensibility in a low degree," but that the chief pain in visceral disease is referred.

The experimental and clinical investigations I am about to describe lead to the conclusion that the view held by Ross is correct, and that disease of the alimentary canal may cause true visceral pain, which is often present alone, but may be associated with pain which is referred to the skin, muscles, and connective tissues connected with the same spinal segments.

In drawing the conclusion that the viscera are insensitive, Lennander and Mackenzie did not take into consideration the fact that a nerve-ending may be sensitive to one form of stimulation—the adequate stimulus—but insensitive to all others. Thus the adequate stimulus for the eye is light, for the ear sound, and so on, although in some cases there may be several varieties of adequate stimulus. All that was proved by Lennander and Mackenzie was that the viscera are insensitive to the particular stimuli which they employed. These stimuli were cutting, pinching, and pricking, none of which occur under natural conditions. It still remained possible that the viscera would be found sensitive were the adequate stimulus employed.

From a consideration of the common causes of visceral pain, it might be expected that tension on the fibres of the muscular coat would prove to be the adequate stimulus, and the observations, which I shall presently record, confirm this view. A certain degree of distension leads to the sensation of fulness if the internal pressure is slowly raised; the same distension rapidly produced leads to the sensation of pain.

Bayliss and Starling[18] showed that stimulation of any part of the intestine leads to contraction above and relaxation below: this reaction they called the "law of the intestine." It is, however, only part of a general law affecting the whole alimentary canal, contraction in one place being always associated with relaxation just below. This is seen most typically at the cardiac, pyloric, ileo-cæcal, and anal sphincters, which normally relax when peristaltic waves coming from above reach them. Meltzer[19] called this law the "law of contrary innervation," and pointed out how it applies to all hollow viscera; he attempted to explain all forms of colic, including the paroxysmal pain produced in pyloric obstruction, to a disturbance in the law of contrary innervation. I believe that his explanation is correct, and I believe, moreover, that other forms of visceral pain, such as the characteristic pain of gastric and duodenal ulcer, are due to the same cause. In colic an abnormally strong peristaltic wave occurs in one part of the alimentary canal; the part immediately below, which would normally relax, is unable to do so owing to organic disease or to spasm due to direct or reflex irritation; the segment between the peristaltic contraction and the point of obstruction becomes more and more distended as it is shortened by the advance of the former; distension being the adequate sensory stimulus, pain is produced.

I believe that tension is the only cause of true visceral pain. Disease in the alimentary canal is often accompanied by pain due to its extension to the parietal peritoneum and sensitive subperitoneal tissue, to drag upon its peritoneal

[11] A summary of James Mackenzie's views is contained in his book, Symptoms and their Interpretation, London, 1909.

[12] J. Mackenzie: Medical Chronicle, vol. xvi., p. 293, 1892, and Brain, vol. xvi., p. 321, 1893.

[13] J. Hilton: Lectures on Rest and Pain, pp. 64 and 74, 1863.

[14] H. W. Verdon: St. Thomas's Hospital Reports, 1874.

[15] Lange: Neuralgier og deres Behandling, Hospitalstid. Quoted by K. Faber: Deutsches Archiv für klinische Medizin, Band lxv., p. 338, 1899.

[16] J. Ross: Brain, vol. x., p. 350, 1888.

[17] H. Head: Brain, vol. xvi., p. 1, 1893, and vol. xvii., p. 339, 1894.

[18] Vide E. H. Starling: Recent Advances in the Physiology of Digestion, London, 1906.

[19] S. J. Meltzer: Archiv für Verdauungskrankheiten, 1 ., 450, 1903.

attachments, as suggested by Lennander, and to reference to peripheral structures, in accordance with the views of Hilton, Lange, Ross, Head, and Mackenzie. But it is generally possible to analyse the sensory symptoms in such a manner that the presence of true visceral pain can be recognised at some stage in the disease. In many conditions, such as the common forms of colic, visceral pain is present alone. On the other hand, referred pain, which is a result of the arrival in the spinal cord of impulses from an internal organ, is comparatively rarely present alone, as the impulses from the internal organ generally themselves give rise to visceral pain. Lastly, pain originating in the peritoneum in connexion with diseases of the alimentary canal is not uncommon in the absence of visceral pain.

Even when the adequate stimulus is employed the viscera are very much less sensitive than the skin to painful stimulation. This is doubtless due, as Langley[20] has pointed out, to the small number of afferent nerve fibres with which they are supplied, the total number distributed to the whole of the viscera of the cat being about the same as the number present in a single posterior spinal root.

One of the arguments most frequently used by those who do not believe that pain can originate in the viscera themselves is its inaccurate localisation. But seeing that painful stimuli cannot be accurately localised in the skin of such parts as the back of the trunk, it is not surprising that localisation is inaccurate in the viscera, which are supplied with an infinitely smaller number of nerve fibres. According to Mackenzie, the situation of the pain of a gastric ulcer, if produced in the ulcer itself, should move when the stomach is caused to move up and down by deep respiratory movements, but it remains stationary. This argument is fallacious, as the brain learns to locate the seat of sensations according to the average position of the part in which they originate, and it is quite impossible for it to recognise changes in position of the part from the character of the sensation, as the impulses which produce this sensation are identical, wherever the part may happen to be at the moment. Thus I have found that when a moveable area of skin is drawn out of its usual position and some part of it is touched or pinched, the sensation produced is referred to the point in space where the stimulated part would normally be, although, if the skin is unusually elastic, this may be several inches away from its actual position. This is exactly analogous to the interesting observation, which Mackenzie regarded as a proof that the viscera are insensitive and that all pain in visceral disease is referred to external tissues: during an operation performed without an anæsthetic the patient felt spasms of pain, which he described as arising near the umbilicus, although they were found to be due to peristaltic waves occurring in a loop of small intestine which had been drawn out of the abdomen and was lying 10 or 12 inches away from the umbilicus.

This "average localisation" of visceral pain explains why it is most accurate in the viscera which move least, such as the gall-bladder, œsophagus, duodenum, ascending and descending colon and rectum, least accurate in the very mobile small intestines, and intermediate in the stomach. If an organ becomes dislocated, pain due to disease in it is still felt in the average position and not in the new position. Thus the pain felt in cases of gastric ulcer is in the same situation whether the stomach is in the normal position or has dropped so low that the lesser curvature may be situated below the umbilicus. In a patient with a painful gall-bladder associated with a large liver the pain was felt in the exact situation which the gall-bladder must have occupied before the enlargement of the liver occurred.

Visceral pain often appears to the sufferer to be so deeply situated that it is impossible to believe that it really originates in structures such as the skin and muscles of the abdominal wall, whereas pain produced by disease of these structures feels definitely superficial. Mackenzie answers this argument by pointing out that the pain in herpes zoster may feel as if it were deeply situated, although, being a result of disease of a posterior root ganglion, it must be a referred pain. But Langley[21] has shown that the nerve cells of the afferent sympathetic neurons are situated in the posterior root ganglia, inflammation of which can therefore lead to pain referred to the distribution of the sympathetic as well as to that of the ordinary spinal sensory nerves. The deeply situated pain in herpes zoster is, in fact, analogous to the abdominal pain, which occurs in disease of the spine or meninges involving the posterior roots of the lower dorsal nerves.

The visceral sensations of fulness and pain probably result from excessive stimulation of the afferent nerves, which normally convey the unfelt afferent impulses concerned in various reflexes. Both Foster[22] and Sherrington[23] have pointed out how improbable it is that the viscera should be supplied with pain fibres, which have no other function, for a man may suffer from pain in a particular organ only once in the course of his lifetime. If the pain were conveyed by special nerve fibres it would be difficult to explain how such a special mechanism could have originated, and, when once originated, how it could have been preserved through perhaps several generations, in which it was never used, in order to give rise to a specific sensation on the one occasion in the individual's lifetime, on which he was attacked by a painful disease of the organ in question.

It is unlikely that the mucous membrane of the alimentary canal contributes to the sensation of fulness or pain, as it is only stretched when the part is greatly dilated, whereas these sensations are felt in the contracted organ when it is subjected to the adequate tension. Moreover, Professor Langley tells me that most of the afferent nerve fibres of the intestines end in the muscular coat, medullated fibres being relatively rare in Meissner's plexus, which supplies the mucous membrane and submucous coat. Possibly the stretching of the connective tissue produced by rapid and extreme distension of the stomach or of a part of the intestine gives rise to a sensation of pain; this would be analogous to the pain, which is apparently produced by tension on the connective tissue capsule of the liver, spleen, and kidneys, when these organs undergo a rapid and considerable increase in volume.

[20] J. N. Langley: Brain, vol. xxvi., p. 23, 1903.
[21] J. N. Langley in Schäfer's Physiology, vol. ii., p. 687, 1900.
[22] M. Foster: Text-book of Physiology, vol. iv., 1891.
[23] C. S. Sherrington in Schäfer's Physiology, vol. ii., pp. 990-994, 1900.

## THE MICROBIC FACTOR IN GASTRO-INTESTINAL DISEASE AND ITS TREATMENT.

BY BERTRAND DAWSON, M.D., B.SC. LOND., F.R.C.P. LOND.,

PHYSICIAN EXTRAORDINARY TO HIS MAJESTY THE KING; PHYSICIAN TO THE LONDON HOSPITAL; CONSULTING PHYSICIAN TO KING EDWARD VII.'S SANATORIUM, MIDHURST, ETC.

IT is an accepted fact that the stomach is, as regards micro-organisms, the least infected part of the alimentary tract. The organisms which exist there in health are harmless and in some measure even beneficial. The freedom of the healthy stomach, in contrast to the intestine, from pathogenic organisms is ascribed to the HCl of the gastric juice. This cannot be a complete explanation. It is more probable that the healthy alimentary canal only permits such microbes as can aid it to get foothold. In the stomach there is not much rôle for bacteria, whereas in the intestine there is.

The freedom of the stomach from germs in good health has led too readily to the assumption that there is the same immunity from pathogenic organisms in ill-health. I think, on the contrary, it can be shown that there are gastric disorders produced by micro-organisms, and that even in patients with structural lesions of the stomach, symptoms—it may be contradictory and misleading symptoms—are seen, which are due to secondary infection by bacteria. That such is the fact seems likely, whether we judge from analogy with infections of the intestinal tract or from a study of the gastric conditions themselves.

We constantly have to widen our conceptions of the part played by infections in diseases of the intestinal tract. A few years ago the name "typhoid" was a less exact term than it is to-day, and included several illnesses which we now recognise as distinct. And although paratyphoid, both A and B, have been defined, further classification in the future is inevitable. All clinicians meet acute and febrile illnesses of the intestinal tract which they cannot name.

The number of diarrhœas which are shown to be of microbic origin increases, and gastro-enteritis, colitis, and even so-called mucous colitis are often due to microbic infection—it may be, e.g., by bacterium coli or bacillus acidi lactici (of Hueppe). Cholangitis and cholecystitis owe their origin to infections of the biliary tract, and the former sometimes is an extension from the duodenum. If the bile-duct and the duodenum, why not the stomach?

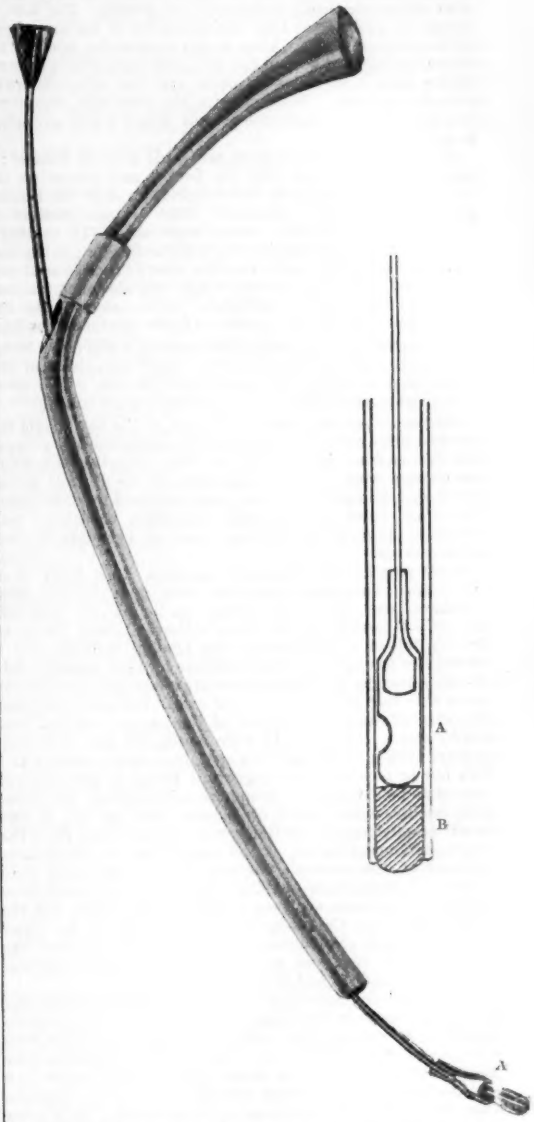
What is frequently the sequence of events in catarrhal jaundice? A patient previously well feels sluggish, perhaps aches, has a headache, appetite vanishes, tongue is foul and slimy, taste horrible, breath smells. At the same time there are discomfort and distension of the epigastrium. Then after a lapse of two or more days from the commencement of these symptoms, jaundice puts in an appearance. Such an illness is very suggestive of an infection, gastric and duodenal first, and biliary later. Or, again, fever and sore-throat attack a household. In the case of one member the cold "strikes inwardly," to borrow a hallowed phrase. Gastric symptoms follow and even sometimes jaundice. One or more members of a family become feverish and ailing. What are they sickening for? is the anxious inquiry. A day or two later some gastro-intestinal symptoms develop. With a feeling of relief the trouble is pronounced to be "stomach." Such an illness suggests a bacterial origin.

Turning to chronic ailments, the following is a picture by no means rare. The patient is constantly inert and "livery." His mouth is sticky, the mucous membrane of the lips glazed, tongue slimy, pharynx shows a ropy mucus and looks sodden. Every few days he describes himself as "rotten." His discomfort, though not localised to, is accentuated in, the upper abdomen. Such people never have a clean tongue, feel seedy for weeks at a time, eat because they are exhausted not because they are hungry, wake in the morning heavy and wretched. Few realise what an effort life in any active sense is for them. If they be people of strong wills, they drive themselves through life carrying their burden, but many find the struggle too much, let their abdomens dominate their lives, and sink into inactivity and despondency. Or, changing the picture in detail, unpleasant tastes, offensive breath, flatulence, gastric discomfort, may be prominent features. Gas is expelled from the stomach whether fasting or after food, and may be offensive. Where lies the cause?

It may be suggested that the offensive smell originates from septic gums or nose, but it exists in cases where the mouth and nose are normal. Moreover, the gas is detected on passing the tube into the fasting stomach, and it is reasonable to conclude that in such cases the gas and its offensive attribute originate in the stomach. Retained stagnant contents and unwise eating and drinking are no doubt frequent causes, but in the group of cases to which I refer there is no retention of contents, and the symptoms persist in spite of careful dieting and a reasonably regulated life. An infection of the gastric mucous membrane offers an explanation of the facts. Nor is it by analogy improbable. Inflammations of mucous membranes in other parts of the body result from microbic infection. One may instance cystitis, cholecystitis, bronchitis. We are no longer content with a diagnosis of bronchitis, nor do we regard chill as a sufficient cause. We examine the sputum not only to know that tubercle bacilli are absent, but what organisms are present. The same holds true of gastritis.

Gastro-intestinal infection is no new idea. It has been dealt with by many workers, and with especial clearness by Herter. I venture to think that its existence has not been sufficiently recognised as regards the upper regions of the alimentary tract. That the gastric mucous membrane can occasionally be the seat of acute infection is well established. One may instance the severe gastritis, with or without hæmatemesis, which occurs during the course and often near the end of acute streptococcal or pneumococcal septicæmias. And there are, again, the rare cases of membranous gastritis due to diphtheria. If acute infections exist, why not those of lower grade running a more chronic course and producing their effects slowly, the manifestations being sometimes gastro-intestinal, and at other times more general, taking the form of failing energy, anæmia, &c.? No doubt gastric manifestations need not presuppose gastric infection. The bacteria may be elsewhere. It may be, e.g., the intestine or the gums, and the gastric disturbances result from the toxins being excreted by the gastric mucous membrane. It is admittedly difficult to differentiate in practice between an intoxication and a septicæmia. The gastritis which goes with oral sepsis may be toxic or a secondary infection of the stomach. The dyspepsia of anæmic women, associated as it occasionally is with hæmatemesis, probably falls into the same category.

With a view to determining the presence and significance of micro-organisms in the stomach, the investigation described below has been adopted. In order to make the results as




Instrument used to obtain sample of stomach contents. A, Bucket. B, Cotton-wool or potato.

reliable as possible, I at first selected cases with definite features, such as furred tongue, foul breath, offensive smell. Care has been taken not to select patients with dilated stomachs, bad teeth, septic gums, adenoids, those who do not eat and drink temperately, and those who are habitually constipated. Hospital patients have not been chosen because their mode of life is seldom sufficiently careful and regular. The patient to be investigated is on ordinary, but light, solid diet. The instrument is usually passed in the early morning into the fasting stomach, no food or drink having been taken

for 10 or 11 hours previously. The mouth is first washed. The procedure consists in abstracting a sample from the fasting stomach contents, without that sample being contaminated. The outer covering of the instrument is indiarubber, resembling a stomach-tube without lateral openings. Inside this is a curved steel ribbon, on the end of which is a small bucket. Before use the two parts are sterilised and the steel band inserted into the rubber tube, so that the bucket is an inch off the opening. The last inch of the tube is plugged with either sterilised cotton-wool or potato. The tube is passed in such a way that the concavity of its curve looks to the patient's right. After it has entered the stomach the bucket is extruded beyond the tube, and then after a moment drawn back well under its cover and the tube withdrawn from the stomach. With practice the tube and bucket can be made to travel towards the pylorus, which it is an advantage to secure.

The contents of the bucket are dealt with as follows:—Loopfuls are removed from the bucket and placed on the various media, and grown at a temperature of 37° C. Smears are also made and examined after Gram's method of staining. The following media were used: (1) bouillon; (2) agar; (3) glycerine agar; (4) acetic acid agar; (5) lactose bile agar; (6) blood agar or serum agar; (7) oleic acid and neutral red. Hydrochloric acid agar was also experimented with, but was found unworkable, for although it set the surface was immediately broken up by the platinum needle.

*Acetic acid agar.*—By using this medium it was often found possible to inhibit the growth of many organisms of the staphylococcic groups, of moulds and sarcinæ, whilst some of the streptococci were found growing in pure culture.

*Glycerine agar* was found to be one of the best media for the cultivation and differentiation of the streptococcal groups, and was used as the medium on which growths were made for vaccine work. When organisms of the B. coli group were found, in order to prevent overgrowth and for differentiation from cocci growth under anaerobic conditions was adopted. Anaerobosis was also used to keep gas-forming organisms alive.

Many gastric and intestinal contents have been thus examined. The bacteriology has been done by Dr. John Matthews and Dr. J. E. Adler, partly at Sir Almroth Wright's laboratory at St. Mary's Hospital, and partly at Dr. W. Bulloch's laboratory at the London Hospital, and I should like to express my indebtedness for their valuable aid. To Dr. Adler my grateful acknowledgments are also due for much able help in working out the cases. The cases examined comprise 38 cases of disorders of the gastro-intestinal and biliary tracts. Of these, 13 were sterile, 16 gave definitely positive results, while in 9 the organisms were a medley and only few in number. The organisms found in the stomach smears and cultures were streptococci, diplococci, bacterium coli, bacillus acidi lactici of Hueppe, and (in one or two cases) staphylococci. Cultures were often taken from the tongue and naso-pharynx at the same time. In some cases analyses of the stomach contents and of the urine were made. If there were intestinal symptoms the fæces were analysed. In these analyses I have several times had the help of Dr. P. J. Cammidge's experience. In a few cases the hydrochloric acid content was very low, but in most the percentage of free and active hydrochloric acid together varied between 0·14 and 0·28 per cent.

A. Lockhart Gillespie (1) in a laborious research investigated the food contents in numerous patients. The rubber stomach-tube used was washed first with boiled water, and then with alcohol. The first 20–30 c.c. of the stomach contents were allowed to escape, then a small quantity was caught in a sterilised test-tube. Gillespie enumerates 24 micro-organisms thus found from the contents of the stomach. Only a few in the list are, however, pathogenic. In using food contents the difficulties must have been greater than in using fasting contents.

Hirschberg and Liefmann (2), with the same object in view, have adopted the following method. The patient received as an evening meal a litre of milk and two eggs at night. He then fasted till the morning, when the stomach was washed out with 200 c.c. of sterile saline solution. A sterilised stomach-tube and funnel were used, the operator's hands being covered with gloves. The fluid was composed of shreds of mucus, but no food particles were found. The mouth of the patient was washed out with peroxide of hydrogen to get rid of the saliva. A little of the saliva was collected for bacteriological examination in a sterile glass, and afterwards plated out in 4 dilutions, 1–10, 1–100, 1–1000, 1–10,000. The stomach washings were also plated out in the following strengths: 1–10, 1–100, 1–1000, 1–10,000, 1 c.c. of each being inoculated into alkaline agar and acid "Vierwurze" agar, and then being poured out into Petri's dishes. The authors give their results in 40 cases, 29 representing gastro-intestinal disorders, and 11 various other diseases. The stomach contents were sterile in 14 cases, of which 6 were gastric and 8 non-gastric disorders. The organisms found by Hirschberg and Liefmann comprised streptococci, diplococci, staphylococci, B. coli, B. para-coli. Comparison between Hirschberg and Liefmann's results and mine is interesting from the fact that my investigations were begun before their paper appeared and were advanced before I had the pleasure of reading it.

*Hydrochloric Acid Content and Bacteria in the Stomach.*

There seems no doubt that hydrochloric acid, especially in the free form, restrains bacterial growth. Gillespie's investigations, confirming those of MacFayden (3), show this. But in the living stomach it is above and beyond the free hydrochloric acid a question of specific resisting power. When the stomach is healthy it is free from microbic infection because its resisting power is high, not only because free HCl is present.

My cases show that pathogenic organisms can exist in the stomach with a normal or raised hydrochloric acid content. Herter (4), too, refers to cases of putrefaction going hand in hand with hyperchlorhydria. Thus the inhibiting effect of hydrochloric acid on microbic growth in the stomach has its limitations, and confirmation is given to the view of Cushing and Livingood (5) that there are influences outside the bactericidal power of the gastric juice to account for the amicrobism of the healthy stomach. Hirschberg and Liefmann concluded that sterile contents go with normal secretion and motility, and if acidity or motility fail bacteria make their appearance. I would modify their conclusions by saying that failure of acidity and motility is primarily evidence of lower resisting power to invasion. Such failure is not necessarily the direct cause of the invasion, but rather its concomitant.

An interesting point which has come out in these investigations is the frequency with which the fasting contents are sterile in gastric and duodenal ulcer, provided there is no marked dilatation. So often is this the case that I begin to regard it as a diagnostic point worthy of attention. It is interesting why sterile contents should go with ulcer; it would not have been surprising if the opposite had been the case. That the sterility is not alone due to the raised hydrochloric acid content has been already shown. All the cases referred to have been proved at operation. In Hirschberg's and Liefmann's list of cases there are three gastric ulcers, and in all, their gastric contents were sterile. Of seven cases recently under my care for ulcer, and all confirmed at operation, six showed sterile contents, whereas in the one which did not there was dilatation due to pyloric stenosis.

CASE 1.—Man, aged 38, ailing for two years; constant epigastric distress, tongue always furred, nasty taste, fœtid breath, offensive eructations from stomach, anæmia, muddy complexion, restless, some loss of flesh, no suppuration of gums, no constipation, no undue retention of stomach contents. Test meal showed 0·15 per cent. free hydrochloric acid. The bucket content showed sometimes a diplococcus and sometimes a streptococcus in short chains. Cultures grew this diplo-streptococcus almost pure. In broth the organism grew in short chains. When first grown on broth, and to a less extent on agar, it yielded an offensive gas resembling in odour the patient's eructations, though it gradually lost this power in subsequent subcultures under aerobic conditions. The gas contained carbonic acid, but owing to imperfect methods not enough was obtained for complete analysis. In this patient a similar gas-producing organism was obtained from the naso-pharynx, which, though a little boggy and red, was not discharging pus.

CASE 2.—This question of gas production is further illustrated by the following. The patient, a man about 40, had epigastric discomfort, dirty tongue, eructations like the last case, but less severely and less constantly. His chief complaint was attacks of pain which in every way resembled gall colic. He had never had jaundice. My diagnosis was cholecystitis with gall-stones. His stomach was bacteriologically examined and a diplo-streptococcus grew freely, as

in Case 1. This organism produced gas of the same fœtor, and by putting the cultures under coal-gas the production was free. An analysis of this gas showed it to consist of carbonic acid, and the fœtor to be due to indol and skatol. There had clearly been decomposition of proteid in the stomach, as the result of bacterial action. The carbonic acid gas only harmed by producing discomfort and interfering with stomach motility. It was the products of proteid cleavage which caused the trouble. Possibly no more occurred in these stomachs than is habitual in the ileum, but the latter is provided with means and devices for dealing with putrefactive processes, whereas the stomach is not.

These two cases have been set forth together because they presented examples of gas-producing organisms. They had not a close clinical resemblance to each other. Case 1 I regarded as a chronic gastric infection, and I may say in passing that striking benefit followed vaccine therapy, where all other methods failed. Case 2, as already stated, was regarded by my surgical colleague, Sir Frederick Eve, and myself as gall-stones, and operation was decided upon. Shortly before the operation I thought it would make for completeness if a bacteriological examination of the stomach was added to the analyses of test-meals, urine, and fæces.

At the operation the gall-bladder and bile-ducts were carefully examined; the former was emptied and no gall-stones found. There was no evidence of ulceration of stomach or duodenum. As the attacks of pain were a serious matter to the patient it was thought wise to examine the appendix. This was found somewhat shrunken, with some old adhesion round it, but nothing to suggest any recent mischief, or any causal relationship between it and the symptoms. As the appendix was exposed it was wisely removed. As nothing was found in the abdomen to explain the symptoms the patient was injected with his own vaccine during a period of convalescence. Although he is quite well, it would be manifestly unfair to draw too confident conclusions from the vaccine treatment. The question for reflection is, What was the cause of the patient's pain? Was it a pyloric spasm? Probably yes, the spasm being produced by gastric irritation, and this in turn, perhaps, resulting from gastric infection. I have met similar cases in which the manifestations have been similarly definite, and yet a blank has been drawn at the operation in spite of all structural causes having been searched for.

*The Appendix and Gastric Disturbance.*

A further reflection arises in connexion with Case 2. What is the cause of the undoubted gastric manifestations which sometimes are associated with a chronically diseased appendix? Are not these cases secondary gastric infections? In some instances the removal of the appendix is certainly followed by subsidence of the gastric symptoms. It is equally true that in other cases the hoped-for cure does not follow the operation, and the gastric symptoms persist as before.

The position at present is too much, "If not gastric or duodenal ulcer, if not gall-stones, then it *must* be appendix." The latter is sometimes responsible for a sense of disappointment at operation, in that it does not show morbid change sufficient to account for the symptoms laid to its charge, and this disappointment is apt to seek relief in the unconscious exaggeration of insignificant structural changes. It is possible, however, that an appendix, without showing any definite structural change, may still be a focus of infection, and that, by its removal, gastric and colonic symptoms will subside. Unfortunately, it not infrequently occurs that the appendix is not *the* focus, but shares in an infection of the cæcum, and by its removal the mischief is not touched. Closer examination of the colon, clinical and bacteriological, is diminishing these mistakes.

*Infections of the Biliary Tract.*

Case 2 also suggests the inquiry: Can there exist disease of the biliary tract simulating gall-stones? The answer is, in my judgment, in the affirmative. Gall-stones are the structural end-product of a tedious infection. They are the common, but not the only, result of such infection. The following case illustrates this contention well:—

CASE 3.—A lady of middle life for many months had had a constant ache and discomfort in the right upper abdomen, going through to the back. From time to time the pain became more acute and of the nature of gall-colic. Without going into further details, the diagnosis arrived at was gall-stones with duodenal ulcer as a possible alternative, and this opinion was shared by Mr. J. Bland-Sutton. At the operation the gall-bladder was bound down by lymph and recent adhesions, most of which could be detached easily by the finger; the serous surface of the gall-bladder was the seat of a subacute inflammation. A careful examination was made of the abdomen, and nothing else wrong was apparent. The gall-bladder was opened, and it and the ducts were carefully examined, and these were normal, with no sign of gall-stones, past or present. A portion of the gall-bladder wall and the contents of the latter were subsequently examined bacteriologically. The bile was sterile, but the wall, which included the serous coat, grew a streptococcus growing in short chains.

This patient's symptoms are now easily explained. The subacute pericholecystitis caused the constant ache, and when the gall-bladder tried to contract to empty its contents at certain stages of digestion the colicky pain was produced. An interesting question is, Would this patient, if left, ever have got gall-stones?

*Colitis.*

I now come to the relation which, I think, sometimes exists beween colitis and the upper portion of the alimentary tract. When the discussion on colitis was being held at the Royal Society of Medicine in 1909, I put forward the view that colitis was looked upon as too strictly a disease of the colon only, whereas there were reasons for thinking that sometimes the colon manifestations are the final expression of a disturbance which has commenced in the upper part of the alimentary tract, just as the digestive changes in any given part of the alimentary canal are influenced by the changes which have occurred in the portions above it. The reasons given for this view were as follows. A patient with chronic colitis is liable to relapses, and these relapses can often be observed to commence with gastric disturbance, and the more definite colonic symptoms to follow, it may be some hours or a day later. If the fæces of colitis patients are examined, they will sometimes show deficient fat digestion. The urine will sometimes give a marked indican reaction, pointing to trouble in the small intestine, and in other instances Cammidge's pancreatic reaction is observed in the urine. (This would be a convenient place to make reference to Cammidge's pancreatic reaction. Differences of opinion exist as to its reliability. Some regard it as useless. This, I think, is because they judge it by too high a standard. My conclusion, based now on many observations, is that it is a good test, well worth consideration in conjunction with other evidence, but that like other data—both clinical and bacteriological—it has its limitations and will sometimes lead one astray.)

The investigations which form the subject of this paper support the above view. In the example I am about to describe, the colon and stomach were separately investigated, the examination of the colon contents by Dr. Matthews pointed to B. acidi lactici of Hueppe being the guilty microbe; the examination of the stomach by Dr. Adler, and subsequently confirmed by Dr. Matthews, showed B. acidi lactici of Hueppe, a diplococcus, and a Gram-positive streptococcus. The finding of the first of these organisms in both colon and stomach was most interesting and suggestive. But this is not all. The patient, who was a severe and long-standing example of colitis, and had been thoroughly and variously treated, improved slowly with vaccine of B. acidi lactici, but after some months the improvement became arrested. A vaccine of the stomach streptococcus was then added to the former, and the improvement recommenced and at increased rate; and the patient to-day, on the testimony of herself and friends, is in better health than for many years past.

CASE 4.—The above case is worth setting forth more fully. Duration, on and off for ten or more years; the usual abdominal symptoms and signs, including the distended and spent cæcum and ascending colon, contrasting with the cord-like descending colon; at the commencement of the exacerbations the stomach would become distended; tongue frequently dirty and mouth unpleasant, nutrition poor, low weight, sallow complexion, easily fatigued; frequently feeling ill; abdominal discomfort with recurrences of pain along the colon; discharge of mucus. There was a history of jaundice eight years ago without pain, lasting three months. Fæces semi-solid, mixed with mucus and mucous casts; well-marked reaction for stercobilin; marked excess of unabsorbed fat, 40·9 per cent. of dry weight as against

normal 15–25 per cent.; high proportion of unsaponified fat, 26 per cent., as against 10–15 per cent. Bacteriologically, two varieties of colonies on lactose litmus plates, which their respective sugar reactions put into two groups: (1) B. acidi lactici of Hueppe, which gave an index of 0·41; (2) Friedländer, which gave an index of 1·08. Urine showed marked indican and pancreatic reactions. The stomach was bacteriologically examined, and, as stated above, B. acidi lactici, a diplococcus, and a Gram-positive streptococcus were found.

This patient was treated with a vaccine, first of B. acidi lactici, commencing with a dose of 6 millions. Later the mixed vaccine of B. acidi lactici and the stomach streptococcus was given, the dose reaching 30 millions of the former and 20 millions of the latter. This patient has slowly improved, and, on the testimony of herself and friends, is better than for years past. The improvement is testified by increased weight, more healthy colour, a feeling of energy and well-being to which she was a stranger; gastric digestion stronger; mucus—with the exception of occasional and slight recurrences—banished from the stools. This patient is still under treatment, and is still improving. There has been no drug treatment, but the diet is carefully selected, and there is a watchful avoidance of fatigue, for let such of these patients who are of the spare type over-exert, and the whole digestive tract will go wrong forthwith.

Whatever conclusions are drawn, the observations in the above case are, I venture to think, interesting and suggestive. For myself, I do not think bacterial infection is the only cause of colitis. It is rather a direct causal factor of varying import, in some cases more dominating, and in others less dominating.

CASE 5 illustrates again the relationship between the lower and upper alimentary tract. The patient, aged 30 years, led an active out-of-door life as a farmer. He had manifestations of colitis; discomfort and dull pain in the large intestine, especially over the cæcum which was dilated; passed mucus with the stools; was slightly constipated. In addition to the foregoing, his tongue was constantly furred, mouth unpleasant, and his breath was offensive, to the distress of his wife; teeth and gums healthy; stomach distended. No bacteriological examination was made of the stools, and the ordinary treatment for colitis was adopted. The colon manifestations improved, the abdominal discomfort diminished, the mucus was less, and the bowels more regular. But mouth and stomach symptoms persisted.

The stomach was then examined bacteriologically, and a diplococcus found and cultivated. Vaccine treatment was alone adopted. At first after small doses of 20 millions the improvement was transitory and sometimes doubtful. When the dose was made 30 and 40 millions at 10–14 days intervals improvement became definite. He felt better and the tongue was cleaner, and his wife bore testimony to the breath losing its offensiveness. In the first three months of improvement, the symptoms began to return when the next dose was due, but later he became quite well and remained so. On two occasions the symptoms were aggravated for 24 hours after the injection, presumably negative phases.

CASE 6.—Patient resembled in sex, age, and general clinical aspect Case 4. There was in addition some visceroptosis. The manifestations were both gastric and intestinal. The features of the urine were well-marked indican reaction, a negative pancreatic reaction, and suspended calcium-oxalate crystals; urea and phosphates were normal; chlorides subnormal. The fæces were acid, the reaction for stercobilin subnormal, total fat was high, and the excess was nearly all unsaponified, suggesting diminished pancreatic function. This patient's stool, though for the most part of normal colour, showed pale almost white patches, like the clay-coloured stool of jaundice. Dr. Cammidge reported these patches to consist of "masses of combined and free fatty acids, chiefly the former, mixed with bacteria, mostly Gram-positive." A vaccine of the patient's B. coli was used in combination with other treatment, as in Case 4, and with the same satisfactory results.

CASE 7.—The following case is suggestive. A woman, aged 35 years, tall, with shallow abdomen, leading a rational life in the country, for years lacked strength, was easily tired, and constantly had spells of abdominal discomfort. This latter took the form either (1) of a dull ache more on the right side, due to a prolapsed mobile right kidney, or (2) pain referred to mid or right epigastrium from a half to one hour after food. No vomiting, no hunger-pain, no localised tenderness; but foul tongue, unpleasant taste, stomach flatulence, intermittent headache. The clinical picture is common enough. Amongst other causes, tea-drinking would produce it, and so would imperfect evacuation of the colon. But no such causes existed; the symptoms persisted in spite of careful dieting and medicaments and a strong desire to be better. Why should it be thus, was the problem constantly pressing for answer.

Further investigation was undertaken. The analysis of stomach contents after the usual test-meal of toast and tea showed as follows:—Well-marked reaction of free HCl, the percentage being 0·12; physiologically active HCl, 0·16; organic acids, 0·02 per cent.; a marked reaction for dextrin and a fair reaction for sugar; only a trace of lactic acid.

This analysis rather suggested a diagnosis of hyperchlorhydria, and it might be argued that the cause lay in the mobility of the kidney. But the stomach symptoms persisted when the kidney symptoms had disappeared, and such a view does not explain the following further data. The fæces and urine were examined by Dr. Cammidge. The urine gave a well-marked reaction for indican, a trace of urobilin, and calcium-oxalate crystals in the microscopic residue, and a positive pancreatic reaction. The fæces, though normal in appearance, showed a strong alkaline reaction, a well-marked reaction for stercobilin, and an excess of unabsorbed fat, the excess being mainly in the saponified fat—viz., 19·5 per cent. of the dry weight as against a normal of 10–15 per cent.

These observations, both clinical and chemical, pointed to the existence of a chronic inflammation, an infection of the duodenum and upper intestine with pancreatitis and recurrent gastritis. It might be suggested that pancreatitis was the bottom of the trouble, but is it not probable that pancreatitis itself is a low-grade infection spreading from the intestinal tract? Assuming this patient does not remain better, one foresees various possible developments; the trouble may focus itself in the stomach, and chronic catarrh with progressive atonic dilatation and gastroptosis result; or again, the infection of the upper intestine may derange the lower, and mucous colitis may result; or again, the infection may extend into the biliary tract and cholelithiasis eventuate. No doubt the order may be reversed, and inflammation of the appendix and colon secondarily involve stomach or duodenum. It is within the experience of all clinicians how despairing such cases as the one just described can be from the point of view of treatment, and this one defied effort.

The stomach was then bacteriologically examined and a diplococcus was obtained in culture, and from this a vaccine was made. The dosage began with 20 millions and gradually rose to 80 millions. Marked improvement followed. The patient (an intelligent critic) asked that the injections might be continued. Whether this is a case of *post*—or *propter—hoc*, it is impossible to be confident. It is a more difficult result to judge fairly of than where objective signs, like foul eructations, exist. The patient's improved health has persisted for many months, and is better than for years past.

### *The Mouth and Pharynx.*

The ill-effects of septic gums are not being considered in this paper. They have received able consideration from many writers, and no clinician can fail to be convinced how far-reaching they are.

Apart from the gums there appear to be infections of the mouth and pharynx which have relationship to gastro-intestinal derangement. How often it happens that throat symptoms are precursors of gastro-intestinal ones! Many dyspeptics have chronic pharyngitis. In many, no doubt, errors of diet or habit account for the double condition. When such errors are absent the trouble is often called gouty, though not always on sufficient grounds. Some of these cases will be found to be chronic infections—either of the pharynx or of the stomach or both. In two at least of my cases associated gastric and pharyngeal signs improved together from vaccine treatment.

CASE 8.—The following is a further example: A man, otherwise healthy, was liable to recurrent attacks of pharyngitis. With them he would get dyspeptic symptoms—what he called "bilious" attacks, and on two occasions catarrhal jaundice supervened. Later, for his throat trouble, he fell into the hands of a vaccine therapist who discovered his pharyngitis was due to pneumococcal infection. Under the vaccine treatment employed, not only the pharyngitis

disappeared, but the digestive trouble at the same time. It cannot be asserted there was gastric infection here, for the stomach was not investigated, but the digestive derangement was too widespread to have been produced by swallowed discharges, which undoubtedly produce gastric catarrh. In a case quoted above the same gas-producing organism was alike found in the stomach and pharynx.

Another familiar clinical experience is the patient who seldom or never is without a furred tongue. When at his best there is nothing but the tongue; when not at his best there are associated dyspeptic symptoms. I only refer to cases that are intractable in spite of careful living. The following case is an interesting illustration.

CASE 9.—The patient was an active and otherwise healthy man. The condition of his tongue and digestion were as above described. His fasting stomach contents were practically sterile, but his tongue yielded a rich growth of a long streptococcus, to which his blood gave a low index. A vaccine was made and tried, and the result was striking improvement lasting many months. The trouble recurred, and the patient was so convinced of the previous benefit that he requested a repetition of the treatment, which his medical man carried out, with like beneficial results.

There is likewise relationship between the pharynx and the intestine. Recently I have had an example of recurrent attacks of pharyngitis occurring in association with recurrent mucous colitis. The pharyngitis was due to pneumococcus, and a vaccine prepared from this pneumococcus improved both conditions, and when suitable doses were exceeded both conditions were temporarily aggravated.

I do not suggest that the colitis was also a pneumococcal infection. What is more probable is that the lowering of resisting power to pneumococcus in the throat leads to a correlated lowering of resisting power in the colon to some organism (say, B. coli or B. acidi lactici (Hueppe)) already there. This correlation of resisting power to different organisms is important. The invasion of a region by one organism seems to carry with it a lowering of resisting power to other organisms, and not necessarily limited to the same region. This suggestion affords an explanation of many clinical findings. A parallel may be found in lead poisoning, which undoubtedly produces a greatly increased liability to gout.

*Tonsillitis and Appendicitis.*

The above remarks remind me of a saying more than 20 years ago by my revered chief, H. G. Sutton—not only one of the greatest clinicians of the nineteenth century but one possessed of that rarest of gifts—insight. He told me one day that tonsillitis and appendicitis find their home in the same subject. The truth of this was not apparent to me then, but Sutton's sayings have a wonderful knack of showing themselves true with the unfolding of the years, and I have satisfied myself there is sound clinical evidence for the existence of this association between inflammations of the tonsils and appendix.

Not only is the sequence of the two events met with, but removal of an appendix will sometimes cure a chronic throat. It could hardly be said that treatment of the throat would cure an appendix once lighted up, though if the above relationship exists a much greater importance must be attached to the state of tonsils in their relation to the prevention of appendicitis. Tonsils need to be judged not only by their size and quantity but by their quality; those of moderate size are sometimes very septic, and as such are sources of danger.

In this connexion it is interesting to note that Hasse (9) has recorded the occurrence in an institution within two months of 30 cases of appendicitis and mostly following tonsillitis. Again, Hans Bachhammer (10) has reported eight cases of suppurative tonsillitis in concurrence with appendicitis. Similar cases have been reported by Apolant in 1897, Jessen in 1898, and Weber in 1902.

Returning to the gastric aspect: broadly speaking there are three pictures presented by the bacteriological examination of the contents of the fasting stomach:—1. The contents are quite or almost sterile. This is the condition of the healthy stomach 10–12 hours after a meal. It is also the condition often found in cases of ulcer. 2. Some organism like a diplococcus or streptococcus is found in great predominance, sometimes almost pure. 3. A medley of organisms is found, denoting a stomach of low resistance, but not necessarily associated with any clearly defined group of symptoms. Sometimes these organisms suggest contamination from above.

That pathogenic organisms exist in the stomach, and even sometimes in spite of the HCl being normal, or in excess, is I think clear. That these organisms have actual foothold and are not mere incidental importations is more difficult to establish. That such foothold, such infection, does occur is supported by the following considerations:—It is in accordance with what we know obtains in other portions of the alimentary tract and the biliary canal. It explains the facts of certain gastro-intestinal disorders. The isolated organisms reproduced the gas which had formed in the stomach. Vaccines prepared effected definite improvements and cures. In some instances accidental over-doses temporarily exaggerated the symptoms, and the production of a negative phase points to the causal organism having been obtained.

The route of invasion no doubt varies; it may be from the œsophagus, duodenum, or blood stream. In some cases the biliary canaliculi may be infected by the blood stream, and then follow descending cholangitis, duodenitis, gastritis. This is what must occur in those acute infections beginning, say, with fever and tonsillitis and passing on to jaundice and gastric disturbance. Sometimes the sequence would seem to be reversed, and a chronic low-grade infection of stomach and duodenum may extend, producing intestinal or biliary derangement. Are not thus explained those cases of cholelithiasis which have for years gastric symptoms as their sole manifestations? Why does Carlsbad undoubtedly do cholelithiasis patients good? Not assuredly because it affects the gall-stones already there, but because it affects beneficially the gastro-duodenal mucous membrane (the chronic infection).

As regards vaccine treatment, in some cases its effect was very convincing. The patients, judged both from the subjective and objective standpoints, improved or were cured. Some relapsed after an interval without treatment, and would come back asking to be injected again, and would again improve. On the other hand, there were instances in which vaccines entirely failed. This discrepancy in results is especially noticeable in colitis—some cases benefiting and others remaining untouched. The larger the neurasthenic element in a case, the less favourable the prospect for vaccine treatment.

Just as the foregoing remarks seek to show that infection is a factor amongst others to be considered in gastro-intestinal diseases, so vaccine therapy takes its place for consideration beside other treatment. No doubt careful eating and drinking, less worry and work, more fresh air and exercise, are potent factors in curing digestive derangements. But such lines of treatment are not always sufficient even if they are feasible.

In conclusion, I am conscious that there are gaps in the evidence and that the investigations have not always been complete. The latter have been conditioned by the tolerance and elusiveness of patients and the exigencies of routine work. I venture to hope however that they justify interest and further inquiry.

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Wimpole-street, W.

OWING to the indisposition of H.R.H. the Duke of Connaught the opening of the Research Institute of the Cancer Hospital (Free), Fulham-road, S.W., announced for Thursday, April 27th, has been postponed.

# A CONSIDERATION OF SOME CASES OF ADVANCED TUBERCULAR JOINTS TREATED BY ILEO-COLOSTOMY.

BY HAROLD CHAPPLE, F.R.C.S. ENG.

*With Remarks by* DR. DISTASO, *Assistant to Professor Metchnikoff.*

A VISIT to the surgical out-patient department of any large hospital will give ample proof of the accuracy of the statement that, despite all our modern methods of treatment, there is still a very large number of patients suffering from surgical tubercular lesions whose conditions have not yet been successfully dealt with. No one can be satisfied with these results, and the older methods have surely been given a sufficient trial and their inadequacy demonstrated in a sufficiently large number of cases to justify us in looking for a treatment that holds out a promise of more certain relief.

In the consideration of the treatment advocated in this paper it may be urged that it is early to speak with any certainty as to the permanency of the results, and the number of cases presented is small; still, there appears to be so little law in the argument on which this treatment is based, and the results have so far been so excellent, that there need be no hesitation in putting forward the facts for careful consideration.

The brilliant researches of Sir Almroth Wright have furnished a method of treatment of undoubted value. In a number of cases this treatment seems to be adequate, but there is still a number in which the inoculations of tuberculin bring about only a temporary rise in the opsonic index with but a temporary improvement of the patient's condition, and there are other cases in which no elevation of the index can thus be produced, so that apparently we cannot rely on this method in all cases.

In the consideration of the question of the treatment of chronic tubercular lesions I have visited the out-patient departments of several of the London hospitals and have observed that almost invariably treatment is directed at the effects of the tubercle bacillus. Of course, we are all familiar with the fact that all of us must at various times be subjected to the possibility of a tubercular infection, and it has long ago been pointed out how frequently the evidences of healed tubercular foci are present at post-mortem inspections. Omitting from the consideration the cases of accidental inoculation, there must be some definite reason why certain individuals are able to deal with their infection whilst others are not. If, then, we try to go a step further back and ascertain why a particular individual is tubercular—i.e., is unable to deal with his own bacilli, and then direct our treatment at the cause of the lowered resistance which has made such an infection possible, we shall clearly be justified in hoping for much better results from such a treatment.

Having established that in persons who are suffering from a condition of chronic intestinal stasis there is taking place from the large bowel an absorption of toxic material which is capable of producing such gross changes as skin staining, cystic degeneration of the breasts, &c., Mr. Arbuthnot Lane raised the question of the effect of this chronic absorption on the resistance to bacterial infection. If one carefully examines a number of such patients there will be no doubt on the evidence obtained that the general resistance is low, nor does it seem at all extraordinary that this should be so.

Having observed the sequence of a tubercular infection on the top of a condition of old intestinal stasis in a large number of cases in 1909, Mr. Arbuthnot Lane commenced the treatment of advanced tubercular joints in patients who showed the signs of intestinal auto-intoxication by ileo-colostomy. Since then I have been able to confirm this sequence in a large number of cases of chronic tubercular lesions in the out-patient department of Guy's Hospital. It will be urged that tubercle and constipation are individually very common complaints, and that a frequent combination would be expected. It need scarcely again be repeated that we are not dealing with constipation as an entity but with an intestinal stasis, of which the constipation is merely one of the commonest signs, but which may or may not be present. There is no doubt that in a very large number of cases one finds an old history of intestinal stasis with evidence of a subsequent tubercular infection. It is submitted that this sequence is more than accidental and that the infection has become possible because of the lowered resistance produced by the auto-intoxication.

If, then, it can be demonstrated in any particular case of chronic infection by the tubercle bacillus, or indeed any other chronic bacterial infection, that the patient is showing these signs of auto-intoxication, is it unreasonable to suggest that in those cases that are resisting simpler treatment this chronic absorption should be first controlled in order that the individual may be thus placed in a better position to combat his own organisms? There is no doubt that this auto-intoxication from the bowel is definitely controlled by ileo-colostomy.

What is the gravity of the measure suggested is the question that naturally presents itself next. The operation itself is followed by very little shock indeed. I have seen many of these patients operated on, and the almost complete absence of shock was one of the most remarkable features. In every tubercular case that has yet been subjected to operative treatment there has been an abnormally long ilio-pelvic colon. The exact significance of this is not quite obvious, but its presence markedly simplifies the operative procedure.

What have been the results of this treatment? The cases recorded have been under the care of Mr. Arbuthnot Lane at Great Ormond-street Hospital or Guy's Hospital, from the records of which I have collected them, and in spite of the fact that as they were the first that have been subjected to such treatment, and consequently the conditions to be dealt with were sufficiently advanced as to be considered almost hopeless, there has been a most marked improvement in the general health, the patient has gained in weight, and the tubercular lesion has most definitely improved. The treatment that has succeeded in these cases can obviously be made to succeed in others if we learn how and when to apply it. It is suggested, then, that in those cases of chronic tubercular lesions in which simpler treatment is resisted, and which show definite signs of auto-intoxication, as a very large proportion of them undoubtedly do, the question of ileo-colostomy should be raised before the case has advanced too far and the general resistance of the patient lowered to such an extent that when the surgeon is called in he is to all intents and purposes invited to resurrect the dead.

The following remarks have been supplied by Dr. Distaso, Professor Metchnikoff's assistant, who has spent much time in London in studying cases of chronic intestinal stasis both before and after operation, and has continued his researches on this subject in the Pasteur Institute. Dr. Distaso has made a special study of anaerobic organisms, and is, I believe, the greatest living authority upon them.

*Remarks by* Dr. DISTASO.

I was astonished to see Mr. Arbuthnot Lane perform the operation of exclusion of the large intestine in children suffering from advanced tuberculous lesions. I was anxious to wait before considering the results of the clinical cases which Mr. Chapple has collected for this short communication, and I wished to see with my own eyes the results of the operation after 12 months. I have done so, and the results are that the children submitted to this operation are in excellent health in spite of the fact that all previous surgical and medical treatments had failed, and exclusion of the large bowel has brought them back to health.

How to explain these facts that at first sight seem paradoxical? We know that it is almost certain that it is only by the alimentary tract that one can become infected, because it has been clearly demonstrated that the pulmonary route plays a part that is almost negligible in tuberculous infection.[1] So that primary pulmonary tubercle ought to be considered a rarity, and is almost always secondary because the bacilli can pass through the mucous lining of the intestinal wall and are carried by the blood stream to the lungs. We know, on the other hand, that localised tubercle is curable, whilst generalised tuberculosis is not. What is the cause of this fact? The most reasonable hypothesis is that the individual is rendered sensitive by the first infection to a second infection. The experiments of Nocard demonstrate

[1] See the experiments of Calmette and Vanstenberge, Annales de l'Institut Pasteur, 1906.

the possibility of the truth of this supposition. He isolated calves infected with tubercle and found that they recovered; on the other hand, calves similarly infected which were not isolated, but exposed to the possibility of additional accidental infections, did not recover. In other words, the possibility of a re-infection is the salient point in tuberculous patients. The method of isolation practised in sanatoria, and the giving to the patients of sputum cups instead of allowing them to use handkerchiefs, are the practical outcomes of this view.

A tuberculous patient in whom the process is generalised unconsciously brings about his own destruction as he swallows into his intestinal tract the bacilli from his lungs, and thus submits himself to a constant source of re-infection. Thus there is set up a vicious circle, in which the bacilli become more and more virulent while passing through the organism.

It is in the large intestine in which the tuberculous process localises itself that we find the most suitable circumstances for this re-infection. If we exclude it, re-infection is no longer possible, and the individual should be thus cured even in advanced cases. This is exactly what has happened in these children whose clinical reports are presented. They were considered incurable, but these cases have demonstrated to the contrary.

From what we have just said it follows: (1) that these cases apparently prove the hypothesis that the route of infection of the tubercular virus is *viâ* the intestine; (2) that a tubercular infection is only curable when re-inoculation is prevented; and (3) that advanced tubercular lesions can be cured if we remove the disposing cause.

This brings me to speak about the problem of tuberculosis. We know that a large number of people at necropsy show tubercular lesions and yet that in a large percentage the lesion was not fatal, so that we must look for other causes that make this disease such a veritable scourge. These predisposing causes are alcoholism, syphilis, constipation, and other things. Especially must we consider constipation with its predisposing effects in favour of the tubercle bacillus because its permits fæcal stasis and consequently brings about the most suitable conditions for the development of all the organisms found in the intestinal flora in these cases, with the results that (1) the possibility of the penetration of the intestinal wall by the tubercle bacillus is brought about; and (2) there is associated the auto-intoxication produced by the putrefaction of the intestinal contents brought about by the condition of stasis.

These deductions we shall put to the test in the laboratory, but we do not wish to touch at present on the subject of immunity. It seems probable, however, that in most cases the individual forms antibodies in response to inoculations by tuberculin, but these do not cure the tubercular process.

## CASES.

CASE 1.—The patient, aged 7 years, was admitted on Sept. 14th, 1907, having first noticed a limp 18 months previously. She had then been treated for seven months in a double Thomas. During the month previous to admission she had had a lot of pain on movement and starting pains. She had always been delicate and had trouble with her bowels. On admission she was found to be a pale, delicate girl, with a tendency to blueness of the extremities. There was limitation of movement of the left hip with great tenderness. She was put on extension and the hip was straightened. She was put up in plaster but the abscess round the joint increased, and on Oct. 23rd the joint was opened, cleared, and closed. She was put in a double Thomas, and on Nov. 6th was sent to a convalescent home. She was readmitted on several occasions, and the left hip was excised, but the condition remained unrelieved. The patient was again admitted in November, 1909, for amputation at the hip-joint. At this time both hips were affected, and there was a large number of septic sinuses discharging a fair amount of pus from the left hip-joint. The child was very badly nourished and she suffered from constipation. She was markedly stained and her condition seemed nopeless. On Nov. 9th the lower end of the ileum was put into the upper end of the rectum. There was definite improvement from that time. The patient got fatter, the wounds improved slowly, the constipation was cured, the skin staining disappeared, and there was continued improvement all the time the case was under observation (12 months).

CASE 2.—The patient, a male, aged 8 years, was admitted into Great Ormond-street Hospital in April, 1910, with advanced tubercular disease of the left hip which he had had for three years and for which he had been under the surgical treatment of a hospital. On admission the left hip was found to be flexed, with limited movement and pain on moving the joint. The child was pigmented and was mentally dull. On April 19th an ileo-colostomy was performed. No local treatment other than placing the limb at rest on a splint was adopted. The boy improved at once, the most striking thing being the mental improvement. The skin became clearer, but the patient suffered from diarrhœa for a few days, and then had normal stools daily. The hip quieted down, the appetite improved and the boy got fatter, and was discharged in a double Thomas.

CASE 3.—The patient, a boy, aged 5 years, had been admitted into the whooping-cough ward at Great Ormond-street Hospital with whooping-cough and tubercular hip. He was very ill. He was again admitted in August, 1910, with tubercular disease of the left hip that had been treated for 12 months by splints, extension, &c. It had progressed in spite of this treatment and an abscess had formed over the anterior aspect of the hip-joint. The patient was very thin, his skin was stained, he was constipated, his appetite was very poor, and the hip was very tender. On August 26th an ileo-colostomy was performed and on Sept. 9th the abscess was aspirated. The boy improved at once and maintained the improvement. He is very much better now and looks extraordinarily well. The hip has quite settled down and is completely healed, and there are now no signs of active disease. A papular tubercular skin rash developed during the convalescence, but this is now very much better.

CASE 4.—A boy, aged 5 years, was admitted into Great Ormond-street Hospital on March 2nd, 1910, with the story that he had begun to limp at Christmas, 1909, and had pain in the right hip. He had had no treatment. On admission the right leg was shorter, everted, and wasted. The gluteal fold was wasted; there were some fixation at the hip and a large abscess round the head of the femur. On March 5th the abscess was opened and curetted with a flushing spoon, and the wound was closed and the limb put up on a splint. On April 5th the scar was excised and the joint was again scraped. On May 7th again it was opened and packed with sulphur. In September, 1910, a large inguinal abscess was opened on the right side. The patient steadily went downhill, and at this time his temperature was daily swinging up and down. He was a pasty-looking boy, with marked staining, diarrhœa, and albuminuria. The sinuses from the right hip were still discharging, and the condition was so desperate that permission was obtained to amputate at the hip-joint in the attempt to save his life. Instead, on Jan. 27th, 1911, an ileo-colostomy was performed. The boy is still in hospital, and is very markedly improved. His temperature is now steady, the staining is almost gone, although there is still some present. He is very definitely now getting steadily but surely better. He has now no diarrhœa, and he has since developed no further abscess. His hip condition is definitely better, and has every appearance now of being on the way to heal.

CASE 5.—A girl, aged 5¼ years, was admitted with tubercular disease of the left knee-joint of two and a half years' standing. It had been in plaster-of-Paris for that time, but no improvement had been made. On admission the patient was definitely constipated and very markedly stained. The knee was flexed, swollen, and hot. On Feb. 21st, 1911, an ileo-colostomy was performed, and the leg was placed on a splint. There has been much improvement in general health. The staining is much improved, the constipation is cured, and the patient is now quite a healthy-looking child, with a good colour, her knee has already improved and the progress of the disease appears to have been arrested.

CASE 6.—The patient, a girl aged 6 years, was first admitted in October, 1907, with a four months' history of hip-joint trouble. She was a weakly child, with extensive disease of the right hip, and a large abscess was present. In the same month the hip was excised and the wound was sewn up. She was put in plaster and discharged to a convalescent home. She was readmitted on various subsequent occasions and the sinus was opened and scraped, but with no obvious advantage. When readmitted in January, 1911, she was noticed to be deeply stained, to have a very poor appetite, and had to be enticed to eat anything, but there

was no history of any constipation. A sinus led down to the right hip, which was in an advanced state of tubercular disease. On Feb. 3rd an ileo-colostomy was performed. The appetite returned, and the patient could eat anything. She put on weight, the skin staining cleared up, and she was discharged very much improved, with the hip trouble most definitely clearing up and the sinus closed. She has certainly most definitely improved both as regards her general health and her local hip affection.

CASE 7.—The patient, a female, aged 4 years, had started to limp 12 weeks previously to admission with pain in the left hip-joint. The condition had got worse in the last few weeks and gave doubtful signs of an abscess. An X ray examination showed marked destruction of the head of the femur and acetabulum. An ileo-colostomy was done on March 31st, 1911, and the patient's condition is quite satisfactory up to the time of writing.

CASE 8.—A boy, aged 12 years, was admitted to Guy's Hospital on Dec. 15th, 1910, with a long history of pain in the left hip-joint. Twelve months previously it had been noticed that it was swollen. The abscess had burst and on admission there were three sinuses leading down to the left hip-joint which was in a state of advanced disease. The right hip was also affected and some pus was present in the joint, which was swollen, tense, and shiny. The patient had been treated for four years in various homes. He was definitely constipated and had required liquorice powder nightly. He was deeply stained, had a very poor appetite, and although it was Christmas-time he was too ill to be at all interested in anything. He was sent in with a question of amputation at the left hip, but his condition was considered too grave and he was thought to be dying. In January, 1911, an ileo-colostomy was performed. Since then the patient has steadily improved. The staining has almost gone, there has been an increase in weight and the general health is very much better. The right hip has cleared up and now is easily moveable, giving no pain. The sinuses leading to the left hip are definitely healing, and altogether the improvement is very marked.

Guy's Hospital, S.E.

## A CASE OF LYMPHADENOMA IN A WOMAN AGED 63 YEARS.

BY ERNEST P. STRATFORD, M.R.C.S. ENG., L.R.C.P. LOND.

MY main reason for recording the following case is the unusual age of the patient—viz., 63 years. It is admitted that lymphadenoma is three times as frequent in men as in women, and I have failed to find a record of a case in either sex over the age of 50. Further, in view of its close simulation of another condition, I am of opinion that a brief account may not be entirely valueless as a warning and a guide to other medical men should they meet with anomalous cases.

The patient, who had been twice married, and was 63 years of age, was herself one of 13 children, and had borne nine children, all healthy. There is no definite disease in any member of the family, no history or sign of syphilis or tubercle. Twelve months ago I was first called in to see her. The tongue was foul, the temperature was 101° F., and there was persistent vomiting with epigastric pain. She had had a rigor. There was no definite tenderness except over the region of the gall-bladder. Slight diarrhœa was present; there was no jaundice, but a general cachexia with colour of a yellowish, pallid type, not unlike pernicious anæmia. This attack passed off under treatment (but not necessarily as the result of the same) by ice-bag to the epigastrium with bismuth et ammon. cit. cum tr. opii. The temperature gradually decreased and the vomiting ceased in five days. The tongue became clean, and the patient's condition was apparently normal except for obvious cachexia and debility. My attention was directed to the condition of the teeth, in consequence of a complaint of pain in the cervical region. On examination masses of glands were to be felt in the posterior triangles bilaterally, and also some of the supraclavicular glands were enlarged. There were eight teeth in the lower jaw; the sockets were affected with pyorrhœa alveolaris and the teeth were loose. I removed these and an artificial set was fitted. The glands did not improve, but increased in size, and after about three weeks a second attack of pyrexia occurred associated with vomiting, foul tongue, and epigastric pains of the most agonising character, accompanied by rigors and lasting for several hours. The sclerotics were definitely tinged yellow, but no general icterus occurred. Whenever the temperature rose and vomiting occurred the glands enlarged, the periadenitis increased progressively, and during the third pyrexial period fluctuation could be detected.

Owing to the periadenitis I decided to incise and not excise the glands, which I accordingly did on both sides, obtaining pus which, on blood serum agar, gave a culture of staphylococci. This I surmised was a secondary infection, and after two injections of 500,000,000 of an autogenous vaccine my surmise proved to be correct, a complete cessation of suppuration followed, and in subsequent pyrexial attacks the glands, although they became definitely enlarged, did not again suppurate.

It would be tedious to go in detail through the whole course of events, but the salient points are worthy of mention. The glandular enlargement has extended, and between June and Dec. 6th or 7th, 1910, recurrences of pyrexia, lasting for four or five days and associated with vomiting, acute epigastric pain, and an enlargement of the cervical and supraclavicular glands, took place. During these recurrences the temperature ranged between 100° and 103°. And on two occasions at least the epigastric pain was so acute that I came to the conclusion that a laparotomy, with a view to examination of the gall-bladder, was advisable. This was done in January, 1911. Somewhat to my surprise everything in the abdomen was absolutely normal, except that the liver was somewhat shrunken and there was a gland in the portal fissure which was obviously enlarged. No stones were present in the gall-bladder or either of the ducts. The gall-bladder was normal in size and structure.

Recovery was uninterrupted except by another attack of pyrexia exactly similar to the preceding ones. Potassium iodide in 20 grain doses was prescribed three times a day after food. From then until now she has had repeated recurrences of pyrexia accompanied by vomiting and a foul tongue, but these periods of pyrexia are diminishing both in frequency and duration. Meanwhile the cervical glands are progressively enlarging, and there are palpable glands in the supraclavicular and axillary regions.

To sum up, during 12 months the patient has had between 20 and 25 attacks of recurrent pyrexia varying between 100° in the morning and 103° at night, in each case accompanied by vomiting and epigastric pain. These attacks have been associated on each occasion with a mild tingeing of the sclerotics and a recrudescence of enlargement of the cervical, supraclavicular, and latterly the axillary glands, and at the same time the tongue rapidly fouls, to clean up as the temperature falls.

Having seen and handled all the abdominal organs, I can say with certainty that there is no malignant disease. Under moderate doses of iodide with 10 grains of sodium salicylate the temperature always comes down. During the last attack I palpated the splenic region and found the spleen definitely enlarged, which it certainly was not 14 days previously.

Syphilis, tubercle, and malignant disease are put out of court by the family history, and the findings at the laparotomy. And I am now reduced to the conclusion that the case is one of lymphadenoma, mainly involving the abdominal glands, but commencing, as is almost classically the case, in the glands of the posterior triangle.

The patient is progressing rapidly on the down grade, and a differential blood count negatives a lymphatic leukæmia. The counts give 11,000 whites, polymorphs 58 per cent., lymphocytes 38 per cent., and large mononuclears 4 per cent. There are one or two red blood corpuscles which show some signs of nucleation, and there is marked poikilocytosis. Unless I am much mistaken these symptoms and physical signs, taken *en masse*, point to the fact that the patient is suffering from lymphadenoma affecting the mesenteric glands, probably mainly those in the portal fissure and the duodenal area. Personally, I can see no other diagnosis which covers the whole field of symptoms, so that, subject to correction or suggestions, I regard this case as one of lymphadenoma. That being so, I am unaware of any record of a similar condition occurring in an otherwise healthy woman of

63 years of age, and I would call special attention to the fact that in its earlier stages the case presented an absolutely true clinical picture of gall-stone colic, so much so that it was only after a negative laparotomy and a consequent revision of the diagnosis that I was forced to the conclusion which I now advance.

Wellington College Station, Berks.

## TWO INTERESTING CASES OF ACUTE INTUSSUSCEPTION AND APPENDICITIS.

BY L. C. MARTIN, M.R.C.S. ENG., L.R.C.P. LOND.

I THINK the two following cases are of sufficient interest to be recorded.

The first, a case of acute intussusception, was brought to me with the ordinary symptoms of blood and mucus passed per rectum and vomiting. The patient was a female child, between 6½ and 7 months old, breast-fed, and healthy-looking. The passage of blood and mucus had set in early in the morning and the vomiting some hours later. The intussusception could be made out by external palpation, and its apex by rectal examination about 2 inches from the anus.

I had the child removed at once to the Hounslow Cottage Hospital, and I operated on the same day in the afternoon. I was able at first to reduce the intussusception a good deal by hydraulic pressure, using a mixture of 2 parts of milk and 1 of water. This mixture was injected slowly—the time occupied being 12 minutes—with the pelvis well raised, by means of a soft indiarubber tube. The amount used was a little under half a pint. I next made an incision in the region of the cæcum and by intra-abdominal manipulation reduced the intussusception sufficiently to bring it out of the abdominal cavity, where, after some trouble, I reduced it completely. I then stitched up the abdominal wound, having previously irrigated the peritoneal cavity with warm saline solution.

For the first 24 hours I kept the child on sips of hot water, as the vomiting was very troublesome. During the greater part of the second day the vomiting continued, and I entertained very little hope of saving the child's life. As a last means of controlling the sickness I washed out her stomach with warm water and sodium bicarbonate (10 gr. to ℥i) until the contents were returned clear. The effect was most remarkable: the vomiting stopped and the child slept for three hours. I then directed that she should be fed with egg albumin and water. From that time the child made a rapid recovery and has now left the hospital.

The interest of this case lies chiefly in the remarkable result obtained by the lavage of the stomach in controlling constant vomiting, and also in the fact that so very few children under a year survive such a severe operation.

The other case was that of a young woman, married only seven weeks, who had been complaining for a day or two previous to my visit of severe abdominal pain. The history was unimportant, save for the fact that she had had a similar attack about two months before she was married, had been under medical treatment, and ultimately recovered. When I first saw the patient her temperature was 102°F. and her pulse was 110, and she complained of pain in the region of the appendix. There was no sign of any peritonitis. The next morning both pulse and temperature were below 100 and the pain was not so acute. I decided then to await events, and not to operate, as I intended to. She remained in much the same condition as regarded pulse and temperature for the next two days. On the fourth day the temperature went up slightly, but the pulse remained below 100. On the evening of the fifth day the pulse went up to 120 and the temperature to 102°.

As it was very late when I saw her I could not have her removed before the next morning, but I operated the next day early. I released the appendix, which was bound down by recent adhesions deep in the pelvis, and removed it, but little difficulty being experienced in breaking down the adhesions. The appendix measured a little over 4 inches and was greatly congested, but it showed no sign of any perforation. There was some free clear fluid in the peritoneal cavity. In the evening the patient looked fairly comfortable, but had been sick several times. The next morning at 9 o'clock I was told that she had vomited all night until 4 A.M., but that subsequently she had had some sleep. Her pulse then was very weak and fast. I injected strychnine hypodermically, but though her pulse got stronger and was not so rapid for a few hours, she sank rapidly and died at 6 P.M.

The unusual and rapidly fatal ending of this case very greatly puzzled me and pointed obviously to something beyond acute appendicitis. I was allowed to make a post-mortem examination so far as the abdominal cavity was concerned; this I did two days after death. There was no septic peritonitis present; the organs looked healthy, but to my great surprise I found a double pyosalpinx, the left ovary healthy, the right diseased and having both on its surface and inside several small cysts, some of them hæmorrhagic. I feel sure that the appendicitis was secondary to the pyosalpinx. Was the first attack she had due to salpingitis? I am inclined to favour that view. If so, it seems as if the process had gone on slowly from the time of her first attack until it culminated in a suppurative condition at the onset of the second attack, when the appendix became secondarily involved. Another question arises as to what was the cause of the salpingitis. Whatever cause may have been at work, it was, I can confidently assert, not due to the gonococcus. I may say that I never suspected any inflammation of the tubes and I always looked upon the case as one of appendicitis.

This case has taught me one great lesson, and that is the necessity of inspecting the right tube when operating for appendicitis in women.

Hounslow.

# Clinical Notes:

## MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

### CHLORATE OF POTASSIUM IN REPEATED MISCARRIAGE.

BY J. F. JEFFERIES, L.R.C.P. & S. EDIN., L.R.F.P.S. GLASG.,
RESIDENT MEDICAL OFFICER, PRETORIA HOSPITAL.

THE use of chlorate of potassium in cases of repeated miscarriage is so little recognised that the success attendant on its use in the following cases is sufficient to warrant their publication.

CASE 1.—The patient, married at the age of 25, had a series of miscarriages and full-term confinements as follows. The first child (female), born 16 months after marriage, reached full term and lived only two days. The mother says that the child was healthy looking at birth, and she attributes its death to prolonged labour, necessitating the use of instruments, resulting in cyanosis of the child. Then followed four miscarriages in succession—each occurring about the end of the fifth month of pregnancy. After this run of miscarriages she gave birth to a full-term child (a female) who is still alive and healthy (aged 10). Labour was normal. The seventh pregnancy again terminated in a miscarriage between the third and fourth months and was attended by a great deal of post-partum hæmorrhage. The next pregnancy also ended in a miscarriage in the fourth month. Thus there were six miscarriages and two full-term deliveries.

As the patient was anxious to have some children she consulted me. On examination the uterus was found much enlarged, with great thickening of the cervix—a condition of subinvolution possibly resulting from her first confinement, which, as I have said, was a difficult one. There was no evidence of syphilis or renal disease. I told her to come back again if she should become pregnant. When I saw her the second time she was two months gone, and forthwith I put her on chlorate of potassium, 5 grains three times a day, and told her that she would have to persevere with it throughout her pregnancy, which she did without any

untoward result from the prolonged administration of the drug. She had a normal labour, and the child (a male) is still alive and healthy and is now 2½ years old.

CASE 2.—The patient married at the age of 20. Menstruation had always been regular up to the time of marriage. She had had two miscarriages about the seventh month. After the first miscarriage menstruation became irregular and excessive. There was no evidence of syphilis. After the second miscarriage she consulted me and on examination I found the uterus enlarged and retroverted. As in the first case, I told this patient to return should she become pregnant. When I saw her again she was two months gone, so I put her on chlorate of potassium, 5 grains three times a day, which she continued to take throughout her pregnancy, with the result that she reached the end of her term and was delivered of a male child who is now 1½ years old and quite healthy. The confinement was normal.

In each case I came to the conclusion that the cause of the miscarriages was a subinvolution of the uterus rendering the full development of the ovum impossible, and having had previous experience of the efficacy of chlorate of potassium in stopping hæmorrhage from, and reducing the size of, a subinvoluted uterus I was determined to try it in these cases—with in each case decided success.

As to the mode of action of this drug in these cases it is difficult to speak definitely; suffice it to say that it possibly acts on the inflamed mucous membrane of the uterus in the same way that it does on other mucous membranes—e.g., the throat. On the other hand, Lawson Tait ("Gynæcological Surgery") is very dogmatic when he says: "Bromide of potash is a specific cure for simple subinvolution, but benefit is derived from the potash and not from the bromine, but the effects of potassium bromide are quite equalled by those of potassium chlorate." He also goes on to say that the other salts of potash—e.g., potassium citrate—would be equally good, but they cannot be taken in sufficiently large doses as they upset digestion, and hence cannot be given over long periods; moreover, they pass out of the system too rapidly.

Pretoria, South Africa.

## A CASE OF EXOMPHALOS.

BY STANLEY BOTT, M.R.C.S. ENG., L.R.C.P. LOND.

IN April, 1907, when in charge of a practice in Worcester, I was called by a midwife to a confinement. On my arrival the baby was shown to me and I found on examination that there was a large pedunculated tumour hanging from the umbilicus; the covering of the tumour was a thin transparent membrane, through which the liver and intestine could be seen. I recognised this as a case of exomphalos and made preparations to restore the abdominal contents to their proper cavity. Mr. Charles Pollard accompanied me, but we then found the condition of the infant so precarious that we decided not to interfere. The baby died about 12 hours later. On closer examination I found the whole of the abdominal contents herniating from a patent umbilicus of about the size of a florin, through which the vessels and connexions of the viscera passed.

Embryologists[1] tell us that the thin transparent membrane covering such tumours is the somatopleure, or belly wall, and that the condition is due to a failure of the bowel to migrate intra-abdominally at the end of the second month during the rapid extension of the lumbar and dorsal regions of the spine and growth of the body walls.

The mother had not given birth to a child for a period of about 15 years. Her environment predisposed her to alcoholic excess.

Bude, N. Cornwall.

[1] Vide Keith's Human Embryology and Morphology.

EALING COLLEGE FOR TRAINING TEACHERS OF THE DEAF.—On Friday, May 5th, at 3 P.M., there will be a meeting at Grosvenor House, 33, Upper Grosvenor-street, W. (by kind permission of their Graces the Duke and Duchess of Westminster), on behalf of the above college. The Earl of Bessborough will preside, and among the speakers will be Mr. Henry Chaplin, the founder of the society, and others.

# Medical Societies.

## ROYAL SOCIETY OF MEDICINE.

### MEDICAL SECTION.

*After-history of Cases of Albuminuria occurring in Adolescence.*

A MEETING of this section was held on April 25th, with the President, Dr. J. MITCHELL BRUCE, in the chair.

Dr. J. F. GOODHART said he had based what he had to say upon all the cases he could find in his private case-books for the last 27 years. Those amounted to 237 cases of all sorts that needed some consideration. That led him to say that he had thought the condition to be an exceedingly common one, and so he believed it to be, for there was many a urine examined where the condition existed but where the albumin was not present at the particular time of examination. He had had to exclude a good many of the 237 for various reasons; 206 were probably straightforward cases, 29 were cases the nature of which was doubtful, one or two of them mature adults in whom the trouble had extended over some years with no apparent injury to health, 10 were probably hæmoglobinuria, &c. So that out of a total, say, of some 30,000 cases of all sorts of disease he had not met with adolescent albuminuria so very often. Many times more often he must have looked for it, expecting to find it and had not done so, and only not done so because he did not happen to hit the physiological moment. The frequency of the disease was one of importance with reference to after-histories, because if so very common, and one could not show that in any number of cases it passed on into actual renal disease or even into ill-health, an argument was supplied in favour of it being an unimportant condition. Why 237 cases summed up all that had been included under the several names—cyclic, intermittent, postural, functional! Adolescent albuminuria might occur at any age. Of 192 cases 32 were of 10 years and under, 65 were of 15 years and under, 61 of 20 years and under, 27 of 25 years and under, and 7 under 30 years. He had at least two others, a man and a woman, older than those mentioned, but he had not included them, as they might seem too open to dispute. But he liked the term (he thought it was Dr. Pavy's original one) "cyclic," for he doubted if the after-breakfast or mid-morning periodicity of the albumin was to be explained purely by posture, or even by exercise superadded. Many had noted—he had seen it himself—the appearance of albumin after food later in the day. Of the influence of exercise there could be no doubt, after Dr. Collier's splendid bit of work upon functional albuminuria in the athlete. And that opened up the cause of adolescent albuminuria. His own cases did not, he thought, help much towards a solution of that question, so many of them had only been seen once or twice, and he had heard no more of them; but he thought that, as nearly everyone interested in the matter had noted, if one wanted to catch one of those cases *flagrante delicto*, of all times in the day the mid-morning hours were the time to choose for an examination. And it was astonishing, as others had also noticed, what large quantities of albumin might be exuded, if he might use such a term without prejudice. He had several times found as much as a half settle down in the test tube, and yet at the next micturition there might be the barest trace or none at all. He was not quite sure if it had ever been proved that posture alone would determine albuminuria in those cases. Posture plus breakfast undoubtedly would, time after time, but what effect had an empty stomach in controlling it? But in addition to that mid-morning albuminuria the urine possessed other features that surely added strength to its cyclic character. All natural functions were cyclic; they had their time to laugh and their time to weep, a time to rest, and a time to act. Micturition was cyclic, and they were not all set to the same time. But it happened to most people that function was active at that particular time, and all sorts of funny things might be found in the urine then. It was a time when the urine might lose for a time its proper acidity; when a quantity of phosphates might appear; when urates appeared; sugar also. He thought that the mid-morning urine revealed a good bit of one's inner life if only the spirit of the artist

were there to recognise and fix not only the bones of a man but his being. Those cases of albuminuria were often associated with a full, or even high, specific gravity and a ready deposit of urates on acidifying. Of 63 cases where that point was specially noted 38 were of high specific gravity; in 13 of those urates were specially noted as being in excess. In nine others phosphates were passed. He was therefore quite in accord with those who thought that the fault was largely a digestive one that defectively prepared products reached the kidney or even acceptable material in too great an excess for the secreting cells to deal with. He was even disposed to think that that might apply to Dr. Collier's cases after severe exercise, already alluded to. He gathered that Dr. Collier had come to think, as he had also, that the condition he described was an unimportant one with regard to the duration of life, but he could not think that if it were due, as had been suggested, to stress upon the small vessels during the exertion that a mechanical exudation such as that could be otherwise than harmful, and ought, one would think, to be accompanied in no small number of cases by the appearance of blood in the urine also. A sudden flux of digestive products, in which the sentinels at the door were crowded out for the time, was, to his mind, a much more likely course of events, and one that in the ordinary course of their work-a-day life they must frequently experience, be prepared for, and take no hurt from. And might not posture tell in a similar direction? A good number of the subjects were pale, flabby, overgrown, and highly nervous subjects, with splashing stomachs and perhaps slow digestions. It had been contended, and as he thought most reasonably, that the albumin appeared in the urine owing to some want of the proper vaso-motor control—a condition, in fact, that in older subjects tended to bring about that general proptosis of the viscera that was called Glénard's disease, and which he should suppose would virtually make a sort of diet question for the kidney by supplying to the secreting cells a pabulum temporarily in excess of their powers of disposal. Then might he say just a word or two upon albuminuria when intermitting, because it seemed to him to have been sometimes quoted as almost in favour of the existence of disease in those cases. It had been quite properly said that it was no proof of a sound organ, and it was well known to occur in some degree in pronounced disease of the kidney, both acute and chronic. But he was inclined to think that it was still more true to say that it was no proof of a structurally diseased one. Was it not true that they were ever ready to allow a large functional element in the maladies, and even the gross diseases of other organs, the brain, the heart, the lungs, the liver, but that albuminurias had always lived, since the days of Bright, under the protection of nephritis and little else? Even now, when they were opening out their minds in undreamt of ways, it had but added to and intensified its sombre character by taking to itself an extra garment that was called arterio-sclerosis. He did not know much about rigidity of arteries and high tension in boys. He hoped to hear more, but he had been wont to attribute such cases as had been ascribed to those conditions to another wide group in general medicine—that of intermittent claudication, but that was a subject he must not touch on then. Everyone knew quite well that even in the kidney there was a large functional element in its diseases, if they did but look for it, and he had to exclude from his cases a considerable group because on the whole those cases leaned, especially at their commencement, to the side of a true nephritis, although they had also a markedly intermitting character. He was not indeed sure that he had done right in excluding them or that he ought not, on the contrary, to have put them before the meeting as a special feature for discussion, for they certainly seemed to him to indicate that a markedly intermitting appearance of the albumin, even when seemingly associated with considerable evidence of renal disease, might be too readily associated with the disease of the organ instead of with the health that remained to it. He did not think that marked intermittency of the albumin could justly be considered a characteristic feature of nephritis either acute or chronic, although it might occasionally occur; therefore when he found it, it always raised the question in his mind, In what condition was the kidney? And as far as his memory served him such cases had mostly been what might not unreasonably be grouped together as of toxic nature—cases, for instance, of uric acid and albumin replacing each other in storms quite gouty in their violence; others, where after a few weeks of failing health, but urine healthy, the urine suddenly became loaded with albumin, which might or might not subside, and so on. Such cases mostly sailed under the licence of acute nephritis, and such they might become, but the very suddenness of their onset was much more in accord with some toxic state, that had determined some actual, but possibly only temporary, damage to the integrity of the secreting cells. Any marked oscillation in the output of albumin was then no more than an evidence of disturbance of function, however much disease there might be behind it. He made so much of that point because it brought all the intermitting albuminurias into line. At one end of it there were the severe cases, that being so might readily, and no doubt often did, lead on to structural change and destruction of the organ; at the other end were the conditions of surfeit or subtoxic states, of adolescent albuminuria, so far as it was renal. Those came and went, and he would maintain all experience taught, without any risk to the renal structure, and they left the subject after a time almost invariably sound. And he would indeed further maintain that the extreme variations of albuminuria so often seen, from large quantities to none at all, within such short periods of time rendered any existing structural fault in the kidney highly impossible. The albumin appeared in nearly all cases of adolescent albuminuria to be a serum albumin. He once had hopes, following Sir Lauder Brunton's suggestion, that something might come out of a differentiation of albumins. Once, many years ago, the analysis of the albuminous urine in a girl of about 7 came back to him as a case of peptonuria. Now and then it had been more a mucinuria than albuminuria. Dr. E. Penny of Marlborough, who he hoped might have been able to add his knowledge to the discussion, wrote pertinently on that matter: "One old boy whom I saw only a fortnight ago told me that he had just been passed for life assurance, and ten years ago he had a large amount of albumin in the morning specimen, but the microscope showed multitudes of spermatozoa, and he imagined that the albumin did not come from the kidneys." He had always thought it worth consideration that just as in old men one occasionally met with sudden and even profuse hæmorrhage from the prostate that might be repeated time after time from what one might suppose to be a prostatic hæmorrhoidal state, so in the turgid condition of early sexual development the prostatic secretion was likely to become charged with unnatural exudates, and the urine to be found in consequence more or less albuminous, but it was not easy to single out that group. He had thought that a few of his cases were probably due to seminal emissions or to masturbation, 14 in all out of 185 cases, but he agreed with Armstrong that the group was not large or important; moreover, if it were, one might suppose that it would sensibly affect the very early morning urine, which, it was clear, was not the case, as all were agreed that the early urine passed on rising was nearly always free. Of other local states that might well claim a share in the production of albuminuria, wounding of the passages by the transit of oxalates, uric acid, and phosphates might be mentioned. That might quite possibly be a frequent source, but how frequent there were, he thought, no means of deciding. There was, however, another condition of young life and adolescence that had, he believed, a very largely determining influence, and that was rapid or inordinate growth. He had taken the average weight for the age in 124 of his cases; 48 were under average and 76 over it, many of them much so. Or if they took the height, out of 106 cases 23 only were average or under height, and several of those were noted as having grown rapidly of late—83 were over the average and perhaps for as much as from 3 to 8 in. Food bolting had also, he suspected, an influence in the promotion of intermittent albuminuria, and it was to those two conditions that he personally looked in chief for the instigation of the trouble. It was probably an affection largely of males, as had always been very generally asserted. He had notes of only six cases in females out of 206. Several reasons might be suggested for that: the urine itself was less often examined; there was the monthly periodical loss, that might well have a controlling influence in various ways; then girls hardly grew with such all-round rapidity as did

boys, and they were much more moderate feeders, and probably less often food-bolters. He finally turned more directly to the after-histories, and in doing so he might say that his own practice had been almost invariably, on finding albumin, to take general stock of the physical condition so to speak, and then to write to the local medical man, telling him what he had found and what he suspected to be the nature of the case, and asking that the urine should be examined three or four times on each of two or three consecutive days; that the sediment should be examined for casts, and that the individual should be watched. But for all practical purposes he held it to be sufficient for diagnosis that the albumin should be established to vary considerably at various times from none in the early morning, through more about 11 A.M., to less again at 5 and bed-time. He liked to hear that albumin was definitely absent some time during the 24 hours. The collected sediment should, however, be examined for casts. The presence of cylindroids was of no importance. Their present-day methods of physical examination were sometimes too perfect for health to stand the glare. He should even confess to having occasionally felt obliged to ignore a solitary granular cast. He alluded to all those points of procedure because he relied upon them to support a point in regard to the after-history of those cases. It had been said, he believed, that happy was the man who had no past. Happy also he whose maladies had no future. And, notwithstanding the high authorities who thought otherwise, he had long held, and still did so, that the albuminuria of the adolescent had no sinister effect upon health or upon the duration of life, and that with due circumspection such cases ought not to be excluded from the advantages of life insurance, or from clerkships in banks and other public and private offices. But he was ready to admit that the requisite evidence that would absolutely establish the truth of that opinion was very elusive, and possibly it was only out of the mouths of many witnesses that it could become established conclusively, if at all. To quote Dr. Penny again, he wrote: "My ignorance of the after-history of these cases is almost complete, they pass out of my sight almost entirely." His (Dr. Goodhart's) own experience was no better, and thus it came, that after looking over his notes and writing to as many doctors in charge as he could identify, he had only been able to collect an after-history of sorts from 38 cases out of 202. But he was not prepared to allow that the negative evidence of the other 164 was of no value. On the contrary, he thought it should be turned to account as he foreshadowed just now. The great majority of the 164 had been committed to the charge of a competent observer, and he thought that if any bad result or even persistent albuminuria had been the common result he should have heard of it, in at least some small proportion of cases. On the contrary, he had heard nothing, and he had repeatedly asked practitioners whether they knew of any ill results from intermittent albuminuria, and it was a condition with which most men were familiar, and he had been able to hear of none. Nor did he remember in the course of all those years embraced by his notes to have come across a single instance of any case he had seen passing on into Bright's disease. He had, of course, seen several where the actual condition was at first in doubt. He had abstracts of several such before him, but not one of them but would at once have suggested further observation and they would have been passed into the group of doubtful cases. As part of the after-history of those cases it might be said, as was well known, that the condition might spread over long periods of time. He found seven that owned a history of several years; a year or more was quite common. During that course the albumin would be quite erratic in its appearance: it might frequently come and go, or it might be entirely absent for weeks together and then come back again for a time. There were those who thought it was an evidence of ill-health, and that it went by the administration of a good tonic. And he was not prepared to say that might not be so with perhaps a good number of cases; but, on the other hand, he had been repeatedly surprised at the tenacity with which it hung about, and therein was the great difficulty of getting really reliable information as to the patient being really well. Many of his cases were well in health and free from albuminuria when last examined, but that was no sufficient guarantee that the tendency to discharge albumin had ceased to exist, but that was the sort of after-history that in too many cases one had to be content with. Of the 38 cases, 36 males and 2 females, the last observation or report was separated from the first in most by many years, from 30 down to 3 and 2, 28 having more than a five years' after-history. In regard to the cases, he had had much anxious consideration as to how to deal with them, for it was impossible to weary the meeting with any narration of them even in short abstract, and yet he did not want them to think the results better or less open to criticism than they were, but as the only feasible thing open to him within the short limits of their time he had drawn out a table which conveyed the length of time over which most of the cases had spread, and the state of health of the patient as far as it could be ascertained at the present time or as late as possible. And that last report was seldom anything but excellent in regard to the general health, although, unfortunately, it too frequently still left them begging for an actual examination of the urine.

Dr. R. SAUNDBY said that he held a favourable opinion as to the ultimate result of cases of albuminuria of adolescence. By the term albuminuria of adolescence he understood Dr. Goodhart to mean cases of people with albumin in the urine but without any other sign or symptom of Bright's disease. It meant that medical men had to make a careful investigation of these cases before they were justified in saying that any case was one of albuminuria of adolescence; where they could satisfy themselves that there was not anything else except simple albuminuria they were justified in giving a good prognosis. There was too great a disposition in this country when albumin was found in the urine to jump to the conclusion that it was Bright's disease.

Mr. H. G. ARMSTRONG (medical officer to Wellington College) said that if a urinary census were to be taken at any large public school it would be found that 15 per cent. of the boys were passing albumin in the urine. He divided his albuminuric cases into four classes. In the first of these, the athletic class, he noted that cross-country running produced in a certain number of boys albuminuria, but it was always associated with evidence of temporary heart failure. The second class he termed emotional and observed that it was not recognised how frequently albuminuria occurred from extreme emotion such as fear. The great majority of his cases belonged to the third or functional class. He considered that the albuminuria was associated with the "getting-up" only and had nothing to do with the boy having had his breakfast. The fourth class was the "lordotic," the essential characteristic being a lumbar lordosis, and in these cases the albuminuria occurred from day to day.

Dr. W. COLLIER (Oxford) said that in 1896 the urine of 156 men in training examined showed traces of albuminuria, some more some less, in 130 cases. He found that the urine of runners after a hard race contained albumin. In 1907 he found that the urine of each one of the crews of five of the boats—i.e., men actually racing—contained albumin and casts, and some of the casts were certainly granular. He considered that the cause of this was acute passive congestion of the kidneys. He noted also that an athlete passing albumin after exercise passed smaller amounts from time to time, until after five hours the albumin disappeared altogether. It seemed to him that if the line was so narrow and fine between urine that did not contain albumin and urine that did, then it could be understood how it was possible to have a form of albuminuria that did not mean much.

Dr. CLEMENT DUKES said that out of 1000 boys examined he found 157 were passing albumin in the urine, but he was sure these cases did not pass on to organic disease. As long ago as 1905 he had protested against these albuminuric boys having their education interfered with, their games prohibited, and their food-supply curtailed, with consequent insufficiency of nutrition for growth.

Dr. W. J. TYSON called attention to cases where albuminuria occurred about 20 years of age and went on for 20, 30, and even 40 years. These cases were not intermittent, for albumin was never found to be absent. He was unable to explain the pathology of these cases; there was no high tension, they were not particularly ill, they were not robust, but they did not die.

Mr. R. CLEMENT LUCAS contended that in a certain number of the cases of albuminuria in adolescence the albuminuria was associated with sexual excitement.

The meeting was then adjourned to Tuesday next, May 2nd.

# MEDICAL SOCIETY OF LONDON.

*Pigmentary Syphilide.—Intussusception in Infants.—Colonic Tetany.*

A MEETING of this society was held on April 24th, Sir W. WATSON CHEYNE being in the chair.

Dr. C. W. CHAPMAN read a short paper entitled "Notes on a Case of Pigmentary Syphilide in a Patient with Heart Disease." He said that the patient was a housemaid, aged 22 years, who complained of præcordial pain, dyspnœa, and œdema of the ankles. Her heart was found dilated in both directions; 9·5 cm. left of the nipple line there was a blowing systolic murmur, musical in character at the apex, a rasping systolic murmur over the aortic valve carried upwards and a loud blowing diastolic carried downwards; there was a systolic thrill in the aortic area; the second pulmonic sound was accentuated. The liver was down to the level of the umbilicus and the spleen was felt 3½ in. below the costal margin. There was visible carotid pulsation. The patient was emaciated and presented brown mottling over the neck and both front and back of the chest. The Wassermann reaction was positive. The urine was acid with a cloud of albumin. The temperature, which was 98° F. on admission to hospital, went steadily up to 101·8° on the sixth day, when there was a profuse perspiration. The temperature chart for the following two and a half weeks showed great oscillation of temperature, and was, in conjunction with the almost daily sweating, highly suggestive of infective endocarditis; an examination of the blood for organisms was, however, negative. The chest was frequently examined, but nothing could be discovered there which could account for the pyrexia, and it was concluded that inflammation of the spleen, consequent on the presence of an infarct, was the most probable explanation of the fever, which theory proved to be correct at the necropsy. On Oct. 25th the pain in the left hypochondrium was very severe and the spleen was found to be very tender, more swollen, and its lower margin was at the umbilicus. The cachexia gradually deepened and on Nov. 13th the patient had a severe attack of vomiting. From this date vomiting was almost a daily occurrence; at the same time the percentage of albumin went up to 2½. The patient died 45 days after admission to hospital.—Dr. F. PARKES WEBER said that he considered the case was one of tertiary syphilitic fever, and referred to a paper of his published in THE LANCET in 1907 describing some remarkable cases of this nature.[1]

Mr. E. W. ROUGHTON read a paper entitled "A Short Account of Fourteen Consecutive Successful Laparotomies for Acute Intussusception in Infants." He said that he was able to record 14 successive cases with no mortality. The number was not large, but it comprised all the cases that had come under his care. Fortunately, they were all early cases. They were all operated on with the least possible delay, and without any previous treatment by inflation or injection. In all his cases the invagination occurred during the first year of life. The oldest was 12 months and the youngest 4 months. In 13 of his 14 cases the invagination involved the region of the ileo-cæcal valve. Intussusceptions in any other part of the bowel were so rare that there must be something in the arrangement of the ileo-cæcal junction of a child which favoured the telescoping of the small into the large bowel. The diagnosis of intussusception could usually be made fairly easily, provided always that the condition was suspected. The most important symptom was the passage of blood and mucus. The presence of blood and mucus on the diaper or on the finger after examining the rectum was of the highest diagnostic importance. Blood and mucus might be passed in conditions other than intussusception, but then fæcal matter was also passed. When a child passed blood and mucus with little or no fæcal material he regarded it as such good evidence of intussusception that he would never hesitate to open the abdomen whether a tumour could be felt or not. One must be on guard not to be deceived by the appearance of these children. During the first 24 or 36 hours, when the child was not screaming with a paroxysm of pain, it often looked so well that it was difficult to realise that it was in the grip of a fatal malady. Often the temperature and pulse were normal. It often happened that no lump was to be detected in the abdomen before an anæsthetic was administered. As a rule when the anæsthetic was administered the lump was readily palpable. It was by no means always the sausage-shaped swelling usually described in text-books; it more often felt rounded or globular. It might be situated anywhere except in the right iliac fossa, but was most commonly found somewhere near the umbilicus. In some cases no lump could be felt even under the anæsthetic. His contention was that there was only one satisfactory way of curing intussusception, and that was by a laparotomy performed at the earliest possible moment. Although laparotomy had made steady progress during the last 20 years, there were still many surgeons who clung to the older methods of injection and inflation. Authors of text-books apparently did not like to leave out methods of treatment which had appeared in so many earlier editions. He was strongly of opinion that when efficient surgery was available distension of the colon with wind or water was a method of treatment which should no longer be employed, but if he were so situated that an abdominal section was impossible or unjustifiable he would employ injection, but in no other circumstances would he do so. It could not be denied that many intussusceptions had been successfully reduced by injection. Clubbe, in his valuable monograph, said that he had succeeded in 14 out of 138 cases. If that represented the average success, the chances were nearly 10 to 1 that the method would fail in any particular case. With regard to the best method of reducing the intussusception opinions differed. Some surgeons, having found the tumour, reduced the bulk of it by rectal injection of water, oil, or milk. Not having employed that method he could not speak of it from experience, but he was not disposed to try it because he could not see any advantage over reduction by gentle squeezing. He could not help thinking that the internal pressure of the rectal injection had no right to be considered more gentle than the external pressure of the surgeon's fingers. The last piece of the invagination should always be brought into full view in order to make sure that the reduction had been complete, and the cæcum and appendix should always be inspected before closing the abdomen. Neglect of that precaution might lead to what was sometimes erroneously called a recurrence of the intussusception. He did not believe that intussusceptions ever recurred when they had been properly reduced. His contention was that if the cases were diagnosed early and treated by laparotomy, without wasting precious time over injection or inflation, recovery would almost always follow.—Sir WATSON CHEYNE emphasised the importance of operating early; if a surgeon got his case within a few hours it was difficult to see why the child should die.—Mr. T. H. KELLOCK deprecated the absolute discarding of any form of inflation. He advocated using inflation for what it was worth, finishing up by making a small abdominal section over the ileo-cæcal valve and reducing the last piece of the intussusception. He pointed out that with spinal anæsthesia there was no prolapse of the intestine.—Mr. WILLMOTT EVANS said that he considered it not improbable that the irregular peristalsis produced by teething powders might form the exciting cause of intussusception.—Mr. HUGH LETT urged the necessity for employing inflation where Henoch's purpura was present in cases of intussusception.—Mr. V. WARREN LOW agreed with Mr. Kellock in regard to inflation, though he himself used injection of fluid, operating on the last inch of the intussusception.—Mr. ROUGHTON replied.

Dr. F. LANGMEAD read a paper on Colonic Tetany. Its object was to call attention to a symptom-complex which had not hitherto been described and which consisted of three symptoms: (1) relapsing tetany; (2) dilatation of the colon; (3) abnormal and offensive motions. In the majority of the patients there were also want of bodily development and backwardness, recalling the cases described by Herter by the title of "intestinal infantilism." The tetany was unusual by virtue of its great chronicity and its tendency to frequent relapses, and was related to the condition of the motions, and independent of rickets, occurring in children past the age period of active rickets. The dilatation of the colon was not always associated with hypertrophy and probably was not always persistent. The paper was based on a series of 14 cases, 7 of which manifested this syndrome in its complete form. In 3 only one attack of tetany had been observed, and in the

[1] THE LANCET, March 16th, 1907, p. 723.

remaining four Chvostek's sign had been present alone, but in an unmistakeable fashion. In one case albuminuria had been present and in another renal calculus, an association not previously recorded. Dr. Langmead had, however, found in the post-mortem records of the Hospital for Sick Children, Great Ormond-street, London, that out of 10 fatal cases of tetany it had occurred three times. He regarded the dilatation of the colon as analogous to the dilatation of the stomach in gastric tetany, the colon acting as a reservoir where intestinal contents collected and underwent putrefaction, tetany resulting either from auto-intoxication or from a specific infection. It was difficult to understand why tetany so rarely accompanied dilatation of the colon if it were produced simply by decomposition of its stagnant contents, and therefore there must have been, in the cases described, either an added infection or an inefficient protective mechanism, probably due to thyroid or parathyroid inadequacy. The paper was illustrated by photographs and drawings.

# Reviews and Notices of Books.

*The Surgery of Childhood, including Orthopædic Surgery.* By DE FOREST WILLARD, A.M., M.D. (Univ. of Pa.), Ph.D., Professor of Orthopædic Surgery, University of Pennsylvania, Surgeon to the Presbyterian Hospital and to the Widener Industrial School for Crippled Children. With 712 illustrations, including 17 in colours. London and Philadelphia: J. B. Lippincott Company. Pp. 800. Price 28*s.*

IN preparing this volume the late author's endeavour was to put in permanent form his personal surgical experiences and to select and present methods of diagnosis and treatment that by long experience have proved to be of rational service. In general arrangement the work follows the common plan of regional classification, the first six chapters being devoted to general surgery, and the following 24 to those subjects which are usually included under orthopædic surgery. There are paragraphs upon such subjects as Roentgen ray anatomy, qualifications of a pædiatric surgeon, methods of diagnosis, anæsthesia, &c., which are too fragmentary to be of service, but the systematic treatment of the affections of the several regions of the body is sufficient, though not very full. The chapters on orthopædic surgery contain a description of the best methods of construction and fitting up of orthopædic hospitals, which, it is stated, should have separate wards for tuberculous joint cases, a specially equipped gymnasium, a shop for the manufacture of apparatus, separate sunny playrooms, and easily accessible sun-porches and roof gardens; also special rooms where surgical dressings and manipulations can be done (since, if they are done in the ward, cries of pain will distress the other children and retard recovery), isolation rooms, detention rooms for newly admitted cases, and anæsthetic recovery rooms. Illustrations are given of the children's ward in the Presbyterian Hospital in Philadelphia and of various departments in the University Hospital of the same city which serve to show some of these advantages and the character of the work carried on at these institutions. Following this are chapters upon each of the more common deformities and diseases which come for treatment to the orthopædic surgeon. The chapter on scoliosis is largely taken up with an illustrated description of the various exercises recommended for this condition and the methods of measuring and recording curvatures of the spine. This is followed by chapters on constitutional diseases productive of deformities, fractures in children, tuberculosis of joints and bones considered generally and in relation to particular joints and regions, and non-tuberculous diseases of the bones and joints, together with other conditions usually considered in text-books of orthopædic surgery.

In his preface the author states that "the book has been prepared fragmentarily in moments snatched from the duties of active professional life," and it may properly be described as a compendium of fragments derived from all available sources and hastily put together. The endeavour to select and present methods of diagnosis and treatment found by long experience to be of value seems to have been forgotten during the preparation of the work, for on most subjects there are no indications of what are the methods which the author prefers and uses. There are 712 illustrations, a half of which could well be spared, like that on p. 13, where a whole page is given to the illustration of "Play-things—essential in the Office of a Children's Surgeon." On p. 27 an illustration appears of a hydrocephalic child with moderately large effusion, and the reader is asked to note the *oscillation* of the eyeballs. Much to be found in the book has been better dealt with and described elsewhere, but we do obtain fragmentary references to many subjects which might be useful to a person who desires a good talking knowledge of orthopædic surgery. But now that so many good books on this subject have been written it is difficult to say to whom this one is likely to appeal.

*The Feeble minded: A Guide to Study and Practice.* By E. B. SHERLOCK, M.D. Lond. With an Introductory Note by Sir H. B. DONKIN, M.D. Oxon., F.R.C.P. Lond. London: Macmillan and Co. 1911. Pp. 327. Price 8*s.* 6*d.* net.

THE author very adequately defines his work as being a guide to study. He has most evidently read widely and thoughtfully, and has massed the results of his labours in such a fashion that his readers may, with the minimum of labour to themselves, become acquainted with the problems connected with this branch of science. The scope of the inquiries which those who interest themselves in the feeble-minded have to pursue is enormous and ranges over a vast field of biology, pathology, and sociology, and it is as well that hasty reform should be held in check by a wholesome knowledge that we are but now at the threshold of the process of stating the problems and by no means yet prepared for their solution. This humble frame of mind will be assisted by the eminently philosophic and judicial comments that Dr. Sherlock makes upon the observations, hypotheses, and deductions made by various inquirers.

It has become customary in works dealing with mental problems to devote a preliminary chapter to an investigation into the nature of mind. Frequently such investigations are conducted by those whose education and studies have scarcely been of a nature permitting them to pose as experts, with the result that we are treated to dogmatic statements clothed in scientific verbiage, and concerning matters which are not properly contained in psychological categories at all. The author has evaded the difficulty by not committing himself, while he has at the same time skilfully presented us with a good, short, but sufficient account of several current speculations. Chapter III. is devoted to a description of the feeble mind, and its qualities are admirably summed up as "a paucity of presentations, an imperfect memory, anomalies of the affective process, and limitation of the faculty of attention." Into each of these defects Dr. Sherlock inquires in detail, succinctly but adequately. Pathology is dealt with in a subsequent chapter under the heading of "Basis of the Feeble Mind," and even here, notwithstanding the gross changes so often found, it is justly remarked that though a large number of data have been accumulated "their abundance unfortunately serves to obscure the fact that cerebral pathology is yet in its earliest infancy." Similarly towards the close of an

exhaustive analysis of the etiological factors of feeble-mindedness, the author points out the considerable diversity of opinion that exists as to the relative importance of the cardinal factors, whether innate or environmental. This is in part due to the lack of precise information, but also seems to indicate a regrettable want of the scientific spirit on the part of those who make confident pronouncements on the matter.

Classification of the varieties of feeble-mindedness is well known to be extraordinarily difficult, and, after laying down certain canons of classification which are wholly admirable, Dr. Sherlock arrives at the conclusion that the best classification on practical lines is that suggested by the Royal College of Physicians of London, though he subsequently suggests one which is derived from various systems and which is more detailed and scientific. In a last chapter upon the Handling of the Feeble-minded the author commends the views of the Royal Commission upon the Care and Treatment of the Feeble-minded, and shortly expounds the methods usually adopted in educating and training. We regret that this part of the subject is somewhat cursorily dealt with, doubtless owing to considerations of space.

As a profound exposition of the subject we can highly recommend Dr. Sherlock's book to all interested. The work is not one merely upon idiots, but contains matter of the highest importance in the treatment of sociological problems. Sir H. B. Donkin has written an Introductory Note to the book, and we are happy to find that in his opinion the work "is by far the most important and useful of all that have as yet appeared on the confessedly important matter which is now creating so wide an interest." The labours of the Royal Commission, of which Sir H. B. Donkin was so distinguished a member, have so far not resulted in legislation, but they have had, nevertheless, a significant effect in crystallising expert opinion and in educating the public at large.

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*Colour Blindness and Colour Perception.* By F. W. EDRIDGE-GREEN, M.D. Durh., F.R.C.S. Eng. Second edition. With three coloured plates. London: Kegan Paul, Trench, Trübner, and Co., Limited. Pp. 322. Price 5*s*.

TWENTY years have elapsed since the first edition of this work was published in 1891. The present issue is practically, if not actually, a reprint of the first edition word for word, with the addition of an appendix of 11 pages. The only page in which we find a material alteration is p. 263 in both editions, where a new form of lantern and a wool test are substituted for the original illustrations. "Phlüger" still stands in the historical introduction, the name of von Kries has been added, but Fraunhofer throughout still appears as "Fraünhofer." The appendix includes the report of the Ophthalmological Society (1904) and some comments and observations by the author, including his theory of visual purple and its diffusion from the rods around the cones and the part he supposes it to play in vision. When the first edition was published the author was connected with the Board of Trade, but when the Colour-Vision Committee of the Royal Society (1892) recommended the Holmgren test and laid it down that it was not necessary for a medical man to test for "vision" and "colour vision," the author's connexion with the Board ceased, and his place was taken by a physicist.

The historical introduction is particularly short and might with advantage have been added to. About 26 pages are devoted to the physical bases of colour, including the chief ways in which light is altered so as to give rise to the sensation of colour—viz., by dispersion, absorption, and interference—and 15 to what is called the psycho-physical perception of colour. There is a physical series depending on the wave-lengths of the undulations and a psycho-physical—i.e., a sensation which is referred to external objects, and depends on differences of the sensations produced by the physical series as revealed in the visible spectrum, which is taken as the standard. In the visible spectrum most persons see six "units," so that a person with normal vision is hexachromic and sees red, orange, yellow, green, blue, and violet. A heptachromic person who sees seven colours, including indigo, is exceedingly rare, occurring only once in several thousands. The author has investigated three cases. Defects of colour vision are classified according to the number of visible units recognised, as penta-, tetra-, tri-, and dichromic vision. The "two-unit" vision forms the class of ordinary red-green blind, and nearly every one of the recorded cases may be assigned to it. These people on being shown a spectrum usually say that it is made up of yellow and blue, the one gradually passing into the other; the brightest part of the spectrum, which is not shortened, is the yellow represented by the colour of a buttercup, while the blue corresponds to the blue of the sky or the blue-violet of the cornflower. We are glad that the almost forgotten observations of Dr. Pole made on himself in 1878 are quoted by the author.

Our visual impressions deal with form, size, shade, and colour, and the author dwells on the question of the perception of shade which is not necessarily associated with defective colour perception, for many more or less colour-blind persons can match shades perfectly. In a person with less than hexachromic vision the colours he sees may be regarded as spread over the spectrum; hence even if he sees only two or three colours this makes it possible to understand how it is that the colour blind are able to recognise colours and correctly name them. The short chapter on the retina would be improved by the introduction of the neuron nomenclature and by a good diagram especially for the use of the lay reader. We need not discuss the author's theory of the supposed action of the visual purple in colour vision (p. 312). The physiological phenomena of colour are considered under six heads: complementary colours; after images, positive and negative; contrast, simultaneous and successive; irradiation; and colour fatigue. It is admitted by everyone that neither of the principal current theories—Young-Helmholtz and Hering—affords anything like an adequate explanation of colour perception, and we agree with Dr. Edridge Green's criticism of both theories. He assumes the existence of separate organs in the retina for the perception of colour and light.

Coming to the actual colour defects the author ranges them under four heads due to—1. Absorption of certain rays by the media of the eye, taking Mulready the painter as an example of this class. 2. Non-excitability of the visual substance of optic nerve fibres by rays of a certain wave-length. 3. Pathological conditions. 4. Imperfection of the colour-perceiving centre. He then lays stress on the information afforded by the colour blind themselves, no leading questions being asked and their remarks taken down without question; but the examination with the spectrum from the scientific point of view is most important. About 80 pages of the book are taken up with careful descriptions of cases of the five-, four-, three-, and two-unit type, and one of total colour blindness. Acquired colour blindness, mistakes made by the colour blind, and accidents through this cause are treated of shortly. Special attention is given to colour blindness in the navy, mercantile marine, and pilot services, and in railway employees, and Dr. Edridge-Green remarks that to him it seems incredible that with our present knowledge of colour blindness the tests in use should be considered efficient. We are, of course, waiting to hear on this point from the Departmental Committee.

When dealing with colour-blind tests for practical purposes it is pointed out that most of the tests in use have been based upon some theory of colour perception. The importance of the lantern test is emphasised as one which is essentially a testing apparatus and not intended for educational purposes. It is the essential test, and no amount of coaching will enable a colour-blind person to pass this test, whilst almost any other may be passed in this way. The Holmgren wool test is condemned by Dr. Edridge-Green for many reasons. Even an uneducated red-green colour-blind person has been taught to pass this test with less than five minutes' instruction, and although if used with knowledge and care it may be employed for the detection of a large number of cases, some cases cannot be detected by its use.

The text of 20 years ago—i.e., 307 pages—is, as we have said, practically unchanged, while the additions are contained in an appendix, where some of the results of recent investigations are summarised. In view of recent events it is to be hoped that this work will help authorities in testing efficiently for the detection of colour blindness, and most of our readers will believe that this efficiency may be best ensured by proper tests carried out by competent trained medical examiners. How reluctant some authorities are to sanction any change, however, is shown by the author's remark in the preface, that it has taken 20 years to obtain official recognition of such propositions as that certain colour-blind men can pass the wool test and that when a definite portion of the spectrum is isolated it appears monochromatic.

The appendix, besides other matter, contains in full the preliminary report of the Colour-vision Committee of the Ophthalmological Society (1904).

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*The Origin of Life: Being an Account of Experiments with Certain Superheated Saline Solutions in Hermetically Sealed Vessels.* By H. CHARLTON BASTIAN, M.D. Lond., F.R.S., Emeritus Professor of the Principles and Practice of Medicine, University College, London. With 10 plates, containing numerous illustrations from photo-micrographs. London: Watts and Co. 1911. Pp. 76. Price 3*s.* 6*d.* net.

THIS memoir was submitted to the Royal Society last October, and the author was informed after a few weeks' interval that it "was not considered suitable for acceptance by the society"—a society of which Dr. Bastian himself is a Fellow. We need not concern ourselves with the observations and comments of the author on the society and the probable causes that led to such action. The author has already written voluminously on the origin of life, especially up to 1877, when other calls left little time for this purpose, but he renewed his experiments and in his work on "Heterogenesis" (1903) he avers that he had seen "amœbæ" formed from the substance of vegetal or animal matrices, such as moss radicles, encysted euglenæ and ciliates, and eggs of rotifers—results obviously completely at variance with commonly received doctrines.

This memoir deals with origin of life included under the terms "spontaneous generation" or "abiogenesis" (Huxley) or, as the author calls it, "archebiosis"—a *de novo* origin in this case not from organic fluids but from *inorganic* solutions. Nothing can be simpler than the author's procedure. Two saline solutions were used—a yellow one composed of distilled water, colloidal sodium silicate, and liquor ferri pernitratis, and a colourless one which contained the same silicate and in addition dilute phosphoric acid and ammonic phosphate. The glass tubes (3 in. by 1 in.) were previously sterilised, the solutions introduced, the vessels hermetically sealed by fusing the open end of the tube, and the tubes exposed for 10 to 20 minutes to temperatures varying from 115° to 130° C. They were then exposed for several months to a south diffuse light or sunlight at an open window. In the deposits which were formed in the tubes and on the particles of these deposits the author asserts that on opening the tubes he found by the aid of the microscope torulæ, bacteria, and moulds. He gives a large number of photo-micrographs of the living forms he asserts were so formed, obtained, as he says, "practically at will from hermetically sealed tubes heated even to 145° C. (293° F.)"—actual "living torulæ and bacteria, which soon under favourable conditions begin rapidly to grow and multiply"; and he assumes that he has demonstrated the actual origin of life. It would be interesting to know the opinion of Professor Hewlett of King's College, who, "though a sceptic," interested himself in the question, so that some experiments were begun in his laboratory, but owing to various causes no report has been supplied on the experiments or on some of the organisms found in the tubes.

Even when we take into account the fact that in certain organic compounds silicon may replace carbon, it is a far cry to the substitution of silicon for carbon in the formation of new protoplasm which the author asserts occurred in his experiments. No one doubts both the ardent conviction and the *bona fides* of the author, who hopes that others may repeat these experiments and seek to obtain similar results. But a caution is added: "for without the exercise of much care it will be easy enough for an unbeliever or even a hasty observer to fail to discover any organisms." We, too, wish that others may repeat these experiments; until then, and until confirmation or explanation of such remarkable results is obtained, we must range ourselves amongst the "sceptics."

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*Fortschritte der Naturwissenschaftlichen Forschung.* Herausgegeben von Professor Dr. E. ABDERHALDEN, Berlin. Berlin und Wien: Urban und Schwarzenberg. Erster Band, 1910. Pp. 306. Price, paper, M.10; bound, M.12. Zweiter Band, 1911. Pp. 364. Price, paper, M.12; bound, M.14.

WE cannot but wonder at the colossal productive scientific activity of Professor Abderhalden on the one hand, and his duties as an editor on the other. We wish both him and his enterprising publishers every success in their new venture, wherein they propose to record from time to time the actual accepted and realised progress in scientific investigation in the whole of natural science, including medicine. No attempt will be made to record the "newest," "latest," "up-to-date" announcements of progress simply because they are the latest, which often turn out to be nothing of the sort, but only additions to the already huge heap of inaccurately recorded observations and unreliable conclusions. The articles will deal only with those subjects that have been carefully worked out and illuminated by cogent criticism, special attention being paid to the citation of "facts." All too often, so-called "facts" are not "chiels that winna ding," in the well-known phrase of Burns; indeed, they are often "disputed."

The first volume, of date May, 1910, deals with such varied subjects as colour photography, explosives, slow combustion and oxydases, determination of weight, the development of photo-telegraphy, new methods for the investigation of the sun, the peculiarities of ferment action in living and dead plants, and the origin of mineral oils—assuredly a mental *menu* of the most varied, perhaps all too varied, character. The learned Geheimrath Professor Dr. A. Miethe, of the Technical High School at Charlottenburg, gives a readable, straightforward account of colour photography within the compass of ten pages, but he does not seem to us to be endowed with optimism, so far as this subject is concerned, expressing the opinion that the probability of finding new methods of colour photography is "not very great." Full justice is done to the work of "der grosse Maxwell" in the

development of the three-colour theory, and the consequently practical application of this hypothesis to the art of colour printing.

The explanation of the oxidation problem of breathing in animals and plants is one of the most difficult in biochemistry. The subject is lucidly set forth by A. Bach in a monograph of about 60 pages, with the title "Slow Combustion and the Oxidation Ferments." While carbohydrates, fats, and proteins are rapidly oxidised in the animal body, outside the body they are practically not affected by free molecular oxygen. To explain the oxidation in the body the author postulates the "activation" of the oxygen, and as the oxidation takes place at the temperature of the body it falls into the group of reactions known as "slow combustion." The theories of Schönbein (1840), Clausius, van't Hoff—whose all too early death only the other day science has to deplore—Hoppe-Seyler, and Traube are set forth. None of these theories satisfies the conditions. The author supports the Engler-Basch hypothesis of the grouping of the oxygen atoms known to chemists as the "peroxide" theory of activation of oxygen. Then follows an account of "catalysis" and catalytic oxidising agents in plants and animals—the metals iron and manganese playing a significant part in some of these obscure processes. As to the part played by the oxydases, it is interesting to note that the earliest oxydase experiment was made over 100 years ago, although the word oxydase was not coined until yesterday. The earliest experiment related to the blue colourisation of tincture of guaiacum by gum arabic, which modern research shows to be due to the action of an oxydase called phenolase, a substance widely distributed both in plants and animals. It is not a far step to tyrosinase *et hoc genus omne* until we come to "oxygenase." The author admits the existence of "gewaltige Lücken," or great gaps, in his presentment of the question. Still, to the physiological chemist the monograph is both instructive and suggestive.

It would be beyond the usual scope of our references to deal with photo-telegraphy and its practical applications as set forth by Professor Korn of Berlin. The portrait of the "Prinz von Wales," our present King, is given as an example of rapid transmission, while as regards telautography we have a picture of King Edward in Berlin on the occasion of the visit of His Majesty in 1909. There are comforting, even optimistic, opinions expressed by the author as to the possibilities of electrical "Fernsehen."

Professor Palladin of St. Petersburg devotes nearly 30 pages to the Peculiarities of Ferment Action in Living and "Deadened" ("abgetödtet") Plants. In the latter the activity of the individual ferments is not coördinated—regulation does not exist. There are many interesting details of experiments that have been carried out by Russian observers, and are, perhaps, not well known in this country. At the end he swings back to "hormones" and the work of Starling and Lane-Claypon on the mammary glands. It would appear that ferment action in cells requires regulators to control their activity. The author has opened up a very suggestive field of investigation.

The second volume deals with the Transmission of Acquired Characters, by Professor Semon of Munich; Fossil Inhabitants of the Sea that Breathed by Lungs, by Dr. Stromer of Munich; The Present Position of Volcanic Research, by Professor Sapper of Strasburg; Ions and Electrons, by Professor Mie of Greifswald; Utilisation of Nitrogen of the Air, by Professor Frenzel of Brünn; Cretinism, by Dr. Bircher of Aarau; and Muscular Atrophies, by Dr. Bing of Basle.

To the medical reader the last two papers are of chief interest. Bircher deals with endemic goitre, a subject which was fully investigated by his father, both in Aarau, where he resided, and in other parts of Switzerland. The author points out the wide relation of goitre to other affections, and gives full descriptions of sporadic goitre, endemic goitre, and that form of deaf-mutism which is often associated with the latter. Cretinism is fully described and discussed. As to the causes of these more or less distinct but allied maladies, the latest investigations point to the water-supply as the chief among them. It is interesting to note that Michael Angelo believed that animals became goitrous from water; and he has left in his own handwriting the following note on the ceiling of the Sistine Chapel: "While working here I had a goitrous swelling like a cat that has drunk Lombardy water." Cretinoid degeneration is not confined to man; it attacks animals as well as man in regions where goitre is endemic. For centuries the causation of this disease has been associated with the water-supply. Rats experimented on with drinking-water from certain geological regions become goitrous. The condition does not appear to be caused by the lime salts present in the drinking-water, nor is it due to a specific organism. It seems to be due to some toxic substance not yet isolated. A careful investigation of the geological formations in goitrous and non-goitrous regions of Switzerland, India, and other countries points to the connexion between cretinoid degeneration and geological formation from which the water-supply is derived or through which it passes. Copious statistics are given of the prevalence of endemic goitre and allied diseases which show the extensive invasion by cretinism of certain districts, more especially in Switzerland. In a short but interesting chapter an account is given of cretinism and goitrous neck as depicted in art, and there is a reproduction of a picture by Van Dyck in the Vienna Gallery of a woman with a well-marked goitre, and also of a cretinoid dwarf.

The short paper on Muscular Atrophies is a *résumé* of the types of this disease so well known in medical practice. One of the longest papers is that on the Transmission of Acquired Characters—a paper fortified with numerous references, and giving an excellent critical account of this vexed question. The paper on Atmospheric Nitrogen is one of great practical importance to the chemist, the economist, and the agriculturist. The day may not be far distant when the chemist may be able to make agriculture independent of the products of Chili and its nitrifying bacteria.

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*Pulmonary Tuberculosis and its Complications, with Special Reference to Diagnosis and Treatment: for General Practitioners and Students.* By SHERMAN G. BONNEY, A.M., M.D., Professor of Medicine, Denver and Gross College, University of Denver, &c. Second edition. London and Philadelphia: W. B. Saunders Company. 1910. Pp. 955. Price 30*s.* net.

THE first part of this large volume deals with the etiology and pathological anatomy of the disease, and in the historical sketch we notice the tribute paid to the work of Klencke in 1843, who was one of the earliest observers to prove the infectivity of the disease. In the discussion of the question as to the relationship between the human and the bovine forms of the bacillus, Dr. Bonney is content to set out the different views held, without formulating any definite conclusion of his own. This is probably the wisest course to adopt in so uncertain a question. A distinction between the smegma bacillus and that of tuberculosis lies in the possession by the former of a coat of fat and sebaceous matter in place of the wax covering the pathogenic germ. Hence the smegma bacillus is decolourised by boiling alcohol. In regard to the mode of infection in pulmonary tuberculosis, Dr. Bonney regards the direct inhalation of the bacillus into the bronchi or lung as a rare occurrence, entrance by the lymphatics of the throat

or of the intestine being the usual method. Here he is in accordance with modern teaching, which, while not adopting the extreme views of Behring on infantile food infection, yet looks on direct inhalation as much rarer than was formerly held to be the case. Nevertheless, the apical localisation of the disease remains almost as difficult of explanation on the newer as on the older theory. Some interesting figures are given as to the racial incidence of pulmonary tuberculosis in the mixed population of the United States, among whose various races the negroes seem to have suffered more extensively since their emancipation, while among the Irish the death-rate is high; Jews, on the other hand, suffer from a chronic form of the affection.

Part II. deals with clinical features of the disease. Dr. Bonney regards clubbing of the fingers as not arising from simple tuberculous infection, but it is difficult to feel any certainty as to the causation of this very obscure feature. He rightly emphasises the occurrence of severe diarrhœa, even apart from ulceration of the intestine, and states that considerable improvement may be effected even in that due to this serious lesion. Complications in general he is inclined to regard as often caused by the "ignorance and superficiality of the physician or by the stubbornness and frivolity of the invalid."

In the third part, which deals with physical signs, the possible presence of advanced disease, even in persons who appear typically healthy, is pointed out. Instructions are given for careful physical examination, including correct percussion, but we did not find the illustration of this last procedure particularly helpful. In the part dealing with diagnosis the employment of Koch's original method of using tuberculin is considered to be usually "quite unnecessary and unwarranted." If employed the first dose should not exceed one-tenth of a milligramme. Dr. Bonney's experience of the ophthalmic use of tuberculin has been favourable, but he gives due weight to the adverse views expressed by others. He declines to express any opinion as to the diagnostic value of estimations of the opsonic index, and finds that the X rays are not of much value in the diagnosis of incipient cases of pulmonary tuberculosis—an opinion with which most observers who have much experience of the disease will probably agree. A large number of skiagrams illustrating conditions which may be met with in the chest are given in this book.

The various complications which may arise in pulmonary tuberculosis are next considered in detail, after which the prophylaxis and treatment of the disease are considered. Dr. Bonney advocates compulsory notification of the disease, the provision of State sanatoriums, and the establishment of tuberculosis dispensaries. He urges that the carriage of consumptives by rail or steamer should be regulated, and that the laws against promiscuous spitting in public places should be strictly enforced. In considering the measures to be adopted for the treatment of individual sufferers he rightly insists on attention to detail in each case, as opposed to general adoption of uniform measures; and utters a needed word of warning against indiscriminate use of such therapeutic measures as manual labour, as well as against the belief that any particular climate is suitable for all cases of the disease.

The book deals very thoroughly with the subject of pulmonary tuberculosis, and while the author does not profess to write for specialists in this field, there are few who would not derive information of value from a perusal of his work. The views expressed are sane and trustworthy, and are evidently the result of personal experience by a practical physician. At the same time the author has made himself acquainted with current writings on the subject, and thus avoided a too limited outlook. The book is lavishly illustrated and well printed. Our only complaint against it is that it forms too bulky and ponderous a volume for comfortable reading.

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*The Hygiene of Infancy and Childhood.* By A. DINGWALL FORDYCE, M.D. Edin. Edinburgh: E. and S. Livingstone. 1910. Pp. 297. Price 6s. net.

IN his preface to this little volume Dr. Dingwall Fordyce expresses the hope that the busy practitioner will find its contents of value in putting him *au courant* with various aspects of pædiatric medicine which would otherwise necessitate wide reading. For our part, we should expect that its field of usefulness would be found in other directions. Admirable as this book is in many respects, and more especially in respect of its philosophic presentation of academic principles in medicine, there is little of that practical and dogmatic teaching to which the busy practitioner readily inclines his ear. In fact, it is not the busy practitioner, but rather the leisured *dilettante*, who will find greatest pleasure and profit in reading "The Hygiene of Infancy and Childhood." The book is divided into five parts. The first treats of the food factor; the second of heredity; the third of environment; the fourth of the bacterial factor—which, by the way, is surely a factor in the environment? And the last of age-periods.

In dealing with the feeding of infants and children, Dr. Fordyce emphasises the importance of studying the personal factor of digestion and general metabolism, and from this point of view his remarks are of the greatest value; but he appears altogether to under-rate the difficulties. He believes in simplicity carried to extremes. This, no doubt, gives good results in straightforward cases, but bad results in difficult cases; and by an extension of the argument less good results in straightforward cases than when the food is accurately adjusted to the nutritional and digestive conditions. As the younger generations come along they will find that the more accurate methods are the more successful, although they may require simple calculations which are somewhat abhorrent to those who are not versed in the methods of chemical analysis and synthesis. Want of such knowledge may lead the practitioner into very egregious errors. We notice that when Dr. Fordyce speaks of condensed milk he says that "it is cow's milk from which, as a rule, about one-third of the water has been removed by heating and evaporation, so that by the addition to condensed milk of twice its bulk of water the composition of the original cow's milk is obtained" (p. 65). We hope that the busy practitioner will not accept these figures without verification. On p. 63 it is stated that "the flocculent curd of highly boiled milk is not so fitted for digestion as that of milk treated at a lower temperature, and it passes more readily onwards to the intestine." We were under the impression that the superior digestibility of condensed milk was due to the fact that it is submitted in the process of manufacture to considerable and prolonged heating. In this section, which taken as a whole is admirably lucid and philosophic, we would demur to the distinction that Dr. Fordyce draws between nutrition and growth; surely growth is only a particular phase of nutrition!

In Section 2 the whole question of heredity is dealt with on broad lines, and there can be no doubt that the author reaches "bed rock" when he suggests that the hereditary transmission of disease probably implies the hereditary transmission of some bias which governs or tends to govern bodily life and development on some particular lines. Although he hesitates to use the word "metabolism," this word, or perhaps metabolic bias, better than any other yet invented, suggests the required shade of meaning. In Section 3 environment

—physical and psychical—is shortly and succinctly dealt with. Fresh air, cleanliness, and exercise are insisted upon as the triad elements in hygiene which are chiefly necessary for healthy development, but the relationship between mind and body—the effect of mental upon bodily conditions—is never lost sight of, and the author expresses his belief that the direction of the progress of medicine will be to bring these two aspects of life into closer relationship. The two final sections, which had it not been for their disproportionate size would have been included as chapters in the section on environment, will be found full of interest to teachers, hygienists, and others concerned in the instruction of youth. They contain, however, little that is important to the practical physician.

Taken as a whole, this little volume will fill a valued place in the rapidly growing library of pædiatrics. It is highly interesting and extremely well written.

## JOURNALS AND MAGAZINES.

*Caledonian Medical Journal.*—In the introductory article of the April number Dr. George M. Cullen of Edinburgh reopens an interesting chapter in the history of epidemics. During the end of the seventeenth and the early part of the eighteenth centuries the Highlands of Scotland suffered severely from a very infectious disease called the sibbens, and about the middle of the eighteenth century a disease known as the yaws was found to be prevalent in the south of that country, which had greatly decreased in frequency at the commencement of the nineteenth century. After 1844 no case of either disease was recorded until, in 1851, a medical man in Banff reported to the parochial authorities that a child suffering from sibbens had been brought into the town, and the word seems from that time to have disappeared from professional language. Dr. Cullen's article will be useful for historical purposes on account of his copious references to, and quotations from, the original authorities, who are unfortunately but few in number. His conclusions are that the dispase called yaws in Scotland was totally different from tropical yaws; that it was probably identical with sibbens; and that sibbens was unquestionably identical with syphilis. The extraordinary infectiousness of sibbens is not fully explained; the generative organs were not necessarily infected in the first instance; and the inference seems to be that it was spread by means of tobacco-pipes, drinking vessels, and other articles of daily use. In a long article entitled "The Modern Aspects of Eugenics," Dr. James P. Sturrock of Perth discusses the declining birth-rate, reproductive selection, the segregation of degenerates, and cognate topics.

KING'S COLLEGE (UNIVERSITY OF LONDON).—In a course of special lectures in physiology eight lectures on the Secretion of Urine will be delivered by Professor T. G. Brodie in the Physiological Laboratory, King's College, London, during the summer term, on Wednesdays, at 4.30 P.M., commencing on May 10th. The lectures will be illustrated by experiments. This course has been recognised by the University of London for B Sc. honours work. It is free to all members of King's College, London, to all internal students of the University, to medical students at any London school, and to medical practitioners on presentation of their cards.

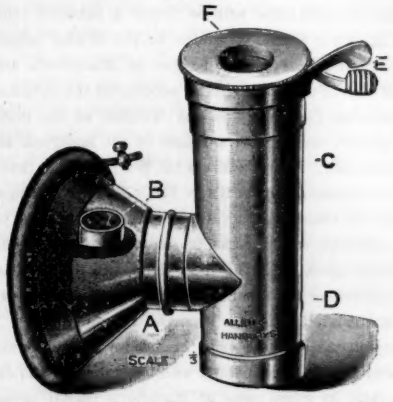
UNIVERSITY OF BIRMINGHAM.—The Ingleby lectures, 1911, will be delivered on Thursdays, May 18th and 25th, at 4 o'clock, in the Medical Lecture Theatre, by Dr. E. F. Bashford, general superintendent of research and director of the laboratory, Imperial Cancer Research Fund, London. The subject taken is Advances in Knowledge of Cancer, and the lectures will be illustrated by lantern demonstrations.

# New Inventions.

## TWO NEW ANÆSTHETIC APPLIANCES.

I HAVE devised the apparatus shown in Fig. 1 for the open or semi-open administration of ether. It is made of metal and consists of a cylindrical chamber (C) open at the top and having another opening about the junction of the lower and middle third leading into the face-piece (A). Below this opening is a well (D) capable of holding about 2 oz. of ether. The inside of the chamber is lined by lint, which dips into the ether at the bottom of the well, and the upper border of which is everted over the brim of the chamber and kept in place by the clip (E). The lint constantly soaks up the ether and presents an evaporating surface of some 20 square inches.

FIG. 1.




The face-piece is of the Roth-Drage type and fitted with an expiratory valve (B). A detachable pneumatic pad is also provided for use in hollow-cheeked individuals; this is figured in the illustration, but is seldom required. The inspiratory valve is not shown; it may be fitted into one of two situations, either (1) into the opening between the chamber and face-piece or (2) into the cap (F) which fits into the top of the chamber when required to carry the valve. The face-piece rotates on its junction with the chamber, so that the apparatus is available with the patient's head turned to the left as well as to the right. Where it is necessary to have the face upturned an angular connexion between the face-piece and chamber can be obtained. Holding the chamber in the hand and with the inspiratory valve in position, as in the illustration, a strong vapour is obtained. By altering the inspiratory valve to the other position this is weakened, and may be further weakened by holding the apparatus by the face-piece, and still further by drawing up the lint out of the ether, thereby doing away with a large evaporating surface. In cases lasting an hour and upwards the amount of ether used only averages about 5½ oz. per hour, and there is very little smell in the operating room. The apparatus was made for me by Messrs. Allen and Hanburys of Wigmore-street, London, W., and has been in use now for the past 12 months.

Fig. 2 speaks for itself; it is a simple combination of a short Junker's terminal with a modification of a Watson-Williams tongue hook. It was devised with the object of setting a hand free. The clip holds the Junker terminal in

FIG. 2.

position, and if traction is required on the tongue one finger is sufficient. To save space the Junker terminal is oval on cross section, and to carry its orifice away from the dorsum of the tongue I have had the end slightly upturned. The length from the orifice of the terminal to the pin is 1½ inches. The makers are Messrs Mayer and Meltzer of Great Portland-street, London, W.

G. A. H. BARTON, M.D. Brux.
Bayswater, W.

# THE LANCET.

*LONDON: SATURDAY, APRIL 29, 1911.*


## Plague in Manchuria.

IN the present issue will be found a detailed report by Dr. G. DOUGLAS GRAY, physician to the British Legation at Peking, on the outbreak of Plague in Manchuria and the north of China, together with an account of the International Conference on Plague, opened at Mukden at the beginning of the present month, and a report of the inaugural address by its chairman. In this address Dr. WU LIEN-TEH (known to many of our readers as Dr. GNOH LEAN TUCK, a distinguished graduate of Cambridge) gives a succinct account of the recent outbreak which presents several interesting features to epidemiologists. In the first place, the disease has been almost entirely of the pneumonic type, the first extensive outbreak of the kind that has occurred for many years. Next the marmot, Arctomys bobac, called in Russia tarabagan, appears to have been connected with the spread of the disease, at any rate, in some parts of Manchuria bacilli presenting all the characters of B. pestis have been found in marmots suffering from sickness, and the case of a Cossack is related who ate the flesh of a diseased marmot and died from plague, as proved by bacteriological examination. There has also been much sickness during the past year among the marmot hunters, and from the symptoms detailed—headache, fever, hæmorrhagic sputum, and speedy death—there can be little doubt that the cause of death was plague, or that the marmot played a similar part to that of the rat in recent Indian experience. Dr. TUCK makes this significant statement—that, despite the apparent risk, there are no figures to show great mortality among the marmot hunters while out on the plains, but when they are gathered together in the late autumn at the market towns, where they crowd into badly ventilated hovels, with piles of raw pelts, living, eating, and sleeping 20 or 30 in a small room, then the disease breaks out. This is very suggestive of some intermediate host, such as the flea or some other similar parasite. The first case reported in Manchuria was in the small town also named Manchuria on Oct. 12th, 1910; the first case in Harbin was on Nov. 7th. After this the disease spread rapidly into Central and Southern Manchuria, and in the provinces of Chihli and Shantung in North China. It is noteworthy that rats have not been affected; many thousands have been examined at Mukden and other centres where plague has been rife, but no evidence of their infection has been found. Two items of practical interest are mentioned by Dr. TUCK: one is the utility of railway wagons for quarantine work; a segregation camp can be easily divided into small units by the use of these wagons, which can be completely isolated and easily ventilated and heated. The other point is the burning of dead bodies, a procedure repulsive to the Chinese mind, but accepted by the people without complaint or obstruction when the Government decided that it was necessary—an example that might be profitably borne in mind by some western populations of an outwardly higher degree of education and enlightenment. This practice was particularly necessary when frost rendered earth burial quite impracticable.

To return to Dr. GRAY'S report, he describes the general features of the epidemic, and mentions the facts that are known about "tarabagan disease." As far back as 1905 Dr. SCHREIBER was despatched by the Russian Government to the infected region in North-West Manchuria to make inquiries as to its prevalence; subsequently Dr. BARYKIN, in 1906 and 1907, continued the investigations in the same tract of country. No further outbreaks of the disease appear to have occurred in this region until the summer of 1910; but both in 1908 and 1909 plague was prevalent among the tribes on the Kirghiz Steppes, where also it was present in the early part of 1910; this, however, is a far cry from Manchuria. So also is Yunnan, which province is an undoubted endemic seat of plague; but this is in South-West China on the borders of Burma. The Manchurian epidemic having started in October, 1910, Dr. GRAY shows that the railway has been the all-important factor in its spread. At Harbin the outbreak was well taken in hand by the Russian authorities, but in the adjoining Chinese town of Fuchiaten the governing official refused to accept Russian medical help (although this was offered) or to adopt any preventive measures; this functionary was not long after dismissed and effective precautionary measures carried out, not, however, until nearly 4000 deaths had occurred in a population of less than 20,000. At the end of December plague reached Changchun, and on Jan. 9th five deaths occurred at Mukden; on the following day a traveller from this place arrived at Peking, sickened on the 12th, and died on Jan. 14th. Few deaths, however, comparatively speaking, have occurred outside the three provinces of Kirin (of which Harbin is the capital), Heilungchiang, and Fengtien (of which Mukden is the capital); Peking and Tientsin have so far not suffered to any serious extent. The outstanding facts are apparently the origin of the epidemic amongst the people who had to do with the marmot or tarabagan, an animal susceptible to epizoötic plague; its spread by means of these people travelling to their homes in the three provinces mentioned, this taking place the more readily owing to the extreme cold of the climate, and the consequent crowding together of the coolie population affected. The rate of spread was parallel with the rate of travel, the railway of course expediting infection from one focus to another. An important and encouraging fact is the virtual escape of places such as Tientsin and Peking that had adopted preventive measures before they became severely attacked. Lastly, isolation of patients and their contacts, and efficient disinfection, have invariably been followed by diminution in the death-rate.

The total loss of life in Manchuria and the adjacent provinces occasioned by this plague epidemic so far

is stated as 42,302; this is not a high figure compared with the 178,808 deaths from the disease in India during 1909, and is relatively nothing compared with the million plague deaths in India in 1908; but if the disease spreads southwards, in the densely populated areas of China proper with its 400 million inhabitants, the prospect will become one of extreme gravity. We believe that the seriousness of the situation is fully realised by the Chinese Government. The International Conference on Plague was opened on April 3rd by the Viceroy of Manchuria, who in his address of welcome showed a statesmanlike appreciation of the situation. Admitting that his country had for long believed in an ancient system of medical practice which had been found serviceable in the experience of centuries, he declared that the progress of medical science must go hand-in-hand with the advancement of learning, and the resources of Western medicine must be made use of for the benefit of the people, as had been the case in the inventions of mechanical science, such as railways and telegraphs. He quoted the late King EDWARD'S famous utterance: "If preventable, why not prevented?" "We in China," he said, "are appreciating the value of that dictum." Professor ZABOLOTNY, one of the representatives of Russia, was chosen as spokesman to convey to the Viceroy the delegates' appreciation of the welcome given them, and bore testimony to the courage and ability shown by the plague staff, Chinese and foreign alike. This meeting of the East and the West in the field of scientific advance and humanitarian endeavour is, we think, of the happiest augury. The representatives of Russia, China, and Japan are meeting together for the good of their respective nations and peoples, without a thought of enmity or rivalry. The European Great Powers have their representatives, also the United States and Mexico. We have no doubt that the Chinese authorities will, in a very short time, be found to be as energetic in applying modern methods of plague prevention and treatment as any Western nation, while the love of order and willingness to submit to authority that is traditional among the people will assist the inauguration of scientific hygiene.

## The Problems of Infant Birth and Infant Feeding.

THE task of the philosopher seeking to unravel the tangled factors in the problems of medical sociology is at once difficult and engrossing. Among these problems few at the present time are more important than those concerned with infant life. During the past few weeks two thoughtful and suggestive addresses have been delivered, dealing with certain aspects of these problems, and since they treat of matters which are of national importance as well as medical they deserve wide and deep consideration. The first of these was a paper read by Dr. DAVID FORSYTH before the Section of Diseases of Children of the Royal Society of Medicine on March 24th entitled "The History of Infant Feeding from Elizabethan Times," publication of which in full may be expected in the journal of the Society. The second was the Edward Jenner Lecture on the Declining Birth-rate, delivered at St. George's Hospital and published in full in THE LANCET last week.

The subject of infant feeding is one upon which instinct, superstition, empiricism, and scientific investigation have all left their mark, and yet it is one which is still the battle-ground of rival schools. Dr. FORSYTH, in his interesting address, which bore the impress of considerable research and much careful thought, examined at some length the evolution of the generally accepted views both in regard to breast feeding and artificial substitutes from Tudor times to the present day. Then utilising the information obtained from a critical survey of the changes during this period he endeavoured to forecast the direction upon which future advances will be made. From a study of the historical material available to him Dr. FORSYTH found that in Elizabethan times breast-feeding, either from the mother or a wet-nurse, was practically the only means employed of nourishing infants. Feeding-bottles had not been invented, and the artificial foods were limited to bread and pulse. The earliest mediæval medical authors he could find who dealt with the subject were PAULUS BAGELLARDUS and THOMAS FAIER. BAGELLARDUS, writing in 1487, recorded that the mothers then as a rule suckled their children for two or three years. FAIER, who published a black-letter volume in 1567 entitled "The Regiment of Life," one section of which is headed "The Booke of Chyldren," made no mention of any artificial means of infant feeding, and summed up the question of the choice between mother and wet-nurse in a sentence which, as Dr. FORSYTH happily expressed it, for simple truth and feeling could not be improved upon: "Wherefore it is agreeable to nature, so it is also necessary and comly for the own mother to nourse the owne childe." FAIER gives some good advice on the choice of a wet-nurse and quotes PHAVORINUS, a philosopher, as to the effects of feeding lambs on goat's milk and goats on sheep's milk. The philosopher found that the lambs developed coarse wool, like goat's hair, while the kids fed upon sheep's milk developed hair like sheep's wool. So even wet-nursing was regarded as not without its perils in those early days, and Dr. FORSYTH pointed out how such false observations would prevent the use of cow's milk as a substitute. He also brought forward evidence that the nefarious traffic of baby farming was not unknown in the sixteenth century. In Stuart times little change appears to have occurred, and owing to the insanitary and crowded condition of London the infant mortality by the time of the Restoration had become terrible. JOHN PEACHEY, writing in 1697, discusses the question of infant feeding and lays stress upon the time of weaning, and he maintains that on an average a child should suck for a year and a half to two years, and in general terms he states that a child must not be weaned until it has all its teeth. In the early eighteenth century a change is noticeable, the period of weaning is given at from 18 to 20 months, and for the first time artificial methods of feeding are widely employed, chiefly as adjuncts to breast feeding, water-pap being that chiefly used. Soon, weak broth, pap with Lisbon sugar, and even light clear small beer were added to the dietary of young children. Towards the end of the eighteenth century a more rational method

began to evolve, and Dr. MICHAEL UNDERWOOD, writing at this period, deprecates the giving of bread to new-born infants, and while all in favour of breast-feeding permits the use of cow's or ass's milk, but recommends boiling of the milk. He further curtails the period of breast-feeding to one year. During the nineteenth century great developments occurred, notably the practical disappearance of the wet-nurse, the final acceptance of the principle of artificial feeding, the production of special foods for infants, and the evolution of the feeding-bottle. These factors, together with the further limitation of the period of suckling to a period of seven to nine months—at present the rule—Dr. FORSYTH discussed in detail. He was inclined to think that on the whole the future of infant feeding would lie with artificial methods. He pointed out the disadvantages of cow's milk, and some of its risks, and seemed to regard the patent foods as superior to it. In his rôle of prophet Dr. FORSYTH seems to us unduly pessimistic. He is himself convinced of the superiority of breast feeding, but appears to be hopeless of supporting its claims against the rivalry of artificial methods. It is to be hoped that persistent representations of the advantages of breast-feeding will sooner or later produce noticeable effect. Again, in regard to artificial feeding, pure cow's milk, suitably prepared and modified, is vastly superior to patent foods, and the provision of a satisfactory milk-supply is a practical possibility which must eventually be realised. Certainly, the duty of the medical practitioner is to insist upon the superiority of the better methods and not to accept inferior ones in spite of the specious recommendation of convenience.

A similar, and indeed a deeper, pessimistic tone pervaded Mr. F. E. FREMANTLE'S interesting address, and it must be confessed that his statistics and deductions from them must be deeply disquieting to any thoughtful person who has the interests of his country and his race at heart. Mr. FREMANTLE showed that the declining birth-rate is due to the voluntary limitation of conception. He urged that this decline is greater in the more cultured, more prosperous, healthy, and thrifty classes of the community, and he pointed out the probable results of this, and their danger from a national point of view. His weighty and important address deserves to be very widely read and thoughtfully considered.

## The Limitation of Measles Mortality.

THERE are certain infectious diseases which from the point of view of preventive medicine may not inaptly be spoken of as the elusive maladies, since sanitary administration has up to the present either not concerned itself with them, or its attempts have not been followed by any obvious alteration in their previous habits. Measles, whooping-cough, and influenza at once occur as examples of the maladies in question, and of these three the first named is the one concerning which most has been attempted. Notification has in certain towns been tried for several successive years, but without much success or promise of success; and schools have been closed, both advisedly and ill-advisedly, with no great difference in the results. Yet this disease reaps a more abundant harvest than all the other notifiable infectious diseases put together, while the maiming and disqualifying effects which are liable to accrue in cases which recover must in the aggregate form an economic disaster. The reason advanced for this apathy or ineffectiveness as regards measles has generally been that as the disease is infectious before its true nature, as evidenced by the rash, is determined, administrative means can avail but little. But this has always seemed to us a somewhat illogical position, and as a matter of fact the same argument might be adduced against action in dealing with diseases such as scarlet fever, diphtheria, or typhus fever, for in the majority of cases of these diseases the malady is infectious before the condition is recognised. Indeed, in nearly all cases of infectious disease there is infectivity before recognition, or at any rate before effectual isolation, but this fact has, so far as we are aware, never been urged in favour of inaction in scarlet fever, diphtheria, or typhus fever. But in so far as active steps are concerned, it is probably true that in the case of nearly all preventive diseases the first administrative movements have been made in response to purely humanitarian demands. Many lives have been lost, and public opinion asks that something shall be done, generally with a somewhat vague notion as to whether such "something" will be likely to prove effectual or not. The public conscience is awakened, and efforts must be made to stem the tide of death. This is what has virtually happened in regard to measles at the present time, and there is, we think, prospect that good may come out of the efforts that have been made.

A useful memorandum has recently been issued by the medical officer of the Local Government Board in which the difficulties and possibilities as regards control of measles are fully discussed. No doubt the greatest difficulty is the non-recognition of the disease. Medical attendance is but rarely sought for this complaint among the lower classes, and without such attendance recognition and notification cannot follow. Moreover, the experience of compulsory notification in respect of other diseases does not hold out much hope that, if the duty of the notification of measles were placed upon the parent, any very useful purpose would be served. There is, however, one important source of information as regards measles, and indeed other infectious diseases as well, which has not so far been utilised as fully as it might have been. The school attendance officer on his rounds hears much which is not true, but he is clearly in an extremely favourable position to hear rumours as to the possible existence of measles in any given family, and an efficient coördination between himself and the local medical officer of health should bring to light suspected cases and lead to the exclusion of patients and families from schools, or perhaps to the closure of certain sections of the schools. The terrible mortality occasioned by measles is largely the result of inexperienced nursing and treatment, and if medical advice could be sought at an early stage, or the children in certain instances be removed to an isolation hospital and properly treated, many lives might be saved.

Hitherto there has been practically no hospital accommodation available for the treatment, altogether apart from

isolation, of cases of measles taken from the houses of the poorer classes in the country as a whole; but recently the Metropolitan Asylums Board has provided a certain number of beds for this purpose and it is likely that similar provision will eventually follow in the provinces. The isolation of every case of measles is, of course, out of the question, and it is open to serious doubt whether, if such were possible, any great reduction in the prevalence of the disease could be accomplished. On the other hand, there can be no question that proper nursing, whether in the hospital or the home, will save many lives, and it is to development of nursing machinery that our efforts should be directed. As the medical officer's memorandum points out, the employment of experienced lady health visitors is probably the best direction in which to work, as such helpers would be of use to the sanitary authority not only as regard measles but in the general education of the working mothers. The children of the educated classes do not die unduly from measles, and if the care with which they are tended can be in a measure extended to the poor some gain will be effected. It is not a question of medicine but of nursing, and similar comment might be made with respect to many diseases other than measles. The real problem is to approximate, as far as possible, in all cases of sickness the conditions of the poor to those of their better-off neighbours.

# Annotations.

"Ne quid nimis."

## INDIGENT ALIENS AND THE PUBLIC HEALTH.

THE introduction in the House of Commons of a Bill dealing with aliens who abuse the open-handed hospitality of this country by committing crimes in it has brought up once more the subject of the indigent foreigner not affected by the Home Secretary's proposals, who, having no intention to live by robbery or violence, comes to England because he believes he will find it a more desirable place of abode than his native land. There is no apparent desire on the part of the Government to hinder him from doing so, and it is, we are aware, a matter of faith with many politicians that the foreigner has in the past become a good citizen and helped to increase our prosperity and that therefore he will continue to do so from whatever motive he may visit our shores and settle in our industrial centres. We have no desire to embark upon a controversial topic of a semi-political character, but there is an aspect of the alien question which appears to us to merit the consideration of those interested in sanitary and social reforms of almost every kind. Many of our citizens now take a direct and practical interest in Poor-law reform, in the housing of the working-classes in town and country, in the education of the worker's children, in their clothing and in their feeding; but men of all classes esteem it desirable, to speak generally, that the lot of the poor should be ameliorated so far as may be practicable. None would profess himself opposed, for example, to legislation which would have as its certain, or even its probable, result the provision of a living wage and a healthy home for every inhabitant of these islands. If, however, we can imagine such a thing brought about, whether by the ingenuity of a Cabinet Minister or by the wand of a magician, are we not necessarily impelled to contemplate at the same moment a rush from every country of Europe towards a land so obviously attractive, and would not the influx of the next few weeks after the consummation of the feat suggested nullify all or most of its results and provide us once more with a population as underfed, overcrowded, diseased, and degraded as that which now gives grave cause for anxiety? If the indigent alien comes here because he considers that our indigent classes are better off than himself, do we not increase the attractions for him every time we improve conditions for them; and if we seek to raise the masses now engaging our attention to a higher level of living, shall we not find the space thus left vacant below incessantly replenished, and more than replenished, by fresh and increasing arrivals from abroad? There will always be some ready to descend in the social scale whose sinking into destitution and dependency we must struggle to retard, but the task may well become hopeless if we have to deal as well with an inexhaustible supply from foreign countries which we do nothing to check. No man trying to obtain a high standard of purity for the water in his well would disregard the influx of contaminated water from the surface of the land outside; we may desire to be hospitable, but we may find it necessary to limit our hospitality according to our means. It is not thrown away upon those who avail themselves of our tacit invitation to come among us and who without great delay can take their place as useful citizens. We are entitled, however, to ask whether we are not wasting it upon others who only join the mass of those whose condition we regard as a plague-spot and a disgrace to our civilisation and for the amelioration of whose lot we are seeking to provide at great cost to ourselves.

## HAVE MOSQUITOES OR FLIES ANY SHARE IN THE SPREAD OF LEPROSY?

FOR some years the medical staff of the United States Public Health and Marine Hospital Service have been investigating, in the Hawaiian Islands and in other places where opportunities offered, the various problems associated with the occurrence of leprosy. Our readers may remember that in THE LANCET of Feb. 27th, 1909, we drew attention to a report on "The Present Status of the Leprosy Problem in Hawaii," by Dr. Walter R. Brinckerhoff, at that time director of the leprosy investigation station in the colony. In that report he discussed with much ability the possibility of the mosquito acting as an agent in the diffusion of the disease, but came to the conclusion that on the whole the probabilities were against such a mode of the spread of leprosy. Since then the question has been receiving further attention at the hands of Passed Assistant Surgeon Donald H. Currie, who is now the director of the Hawaiian Investigation Station. In a series of "Studies upon Leprosy," published recently at Washington, Dr. Currie and his colleague, Acting-Surgeon Harry T. Hollman, contribute a number of articles dealing with leprosy from various standpoints. The most interesting of these are Dr. Currie's experimental studies on the influence of mosquitoes and house-flies in disseminating the disease. On theoretical grounds it appeared possible that mosquitoes drawing blood from a leprous nodule might convey the bacilli to the skin of a healthy person subsequently bitten by the insect. Leprous ulcers are situated often on exposed surfaces, especially on the face, and are therefore easily accessible to the mosquito in search of blood. Moreover, the rubbing and scratching of the site of a puncture on the healthy skin by the person bitten might be thought of as likely to expedite the inoculation. The mechanism for the transference of B. leprae from the leper to the healthy individual, therefore, appears to exist. To determine whether the blood, which the mosquito has imbibed from a leper, contains the bacilli, and whether

such bacilli, if imbibed, remain in the mosquito for a reasonable length of time, Dr. Currie devised a series of experiments. His conclusions now published are unfavourable to the view that the mosquito is concerned in the spread of leprosy. He demonstrates that these insects in feeding do not imbibe B. lepræ for the reason that the mosquito inserts its proboscis directly into a blood-vessel, thus obtaining blood free from bacilli and unmixed with lymph. The insect neither avoids biting a leprous nodule nor is its digestive tract or the contained fluids capable of altering the morphology of this bacillus in a reasonable length of time. The mosquito, therefore, is not, Dr. Currie says, of epidemiological importance as regards leprosy. With respect to the influence of domestic and other flies found in and around houses in Hawaii, Dr. Currie's investigations show that when given an opportunity of feeding on leprous fluids these insects will afterwards be found for several days to contain B. lepræ in their intestinal tract and in the fæces which they drop on food and other articles. This fact, together with the well-known habits of the house fly, make it certain that if there is opportunity afforded to feed on an exposed leprous ulcer these insects will frequently convey immense numbers of B. lepræ, directly or indirectly, to the skin, nasal mucous membrane, and digestive tract of healthy persons. But our present knowledge does not permit us to decide whether such fly borne bacilli are or are not capable of infecting persons whose skins or mucous membranes are thus contaminated. Meanwhile, until this definite knowledge is forthcoming, we are justified in regarding these flies with grave suspicion as being in all probability one of the means by which leprosy is disseminated.

## THE TENEMENT HOUSE AND ITS SANITATION.

AT the North London police court recently the owner of some houses let in tenements to working men was summoned in consequence of alleged defects in the water-supply provided. On behalf of the Islington borough council it was shown that although two or three families resided in each house the water-supply was only obtainable in the sculleries and there were no taps upon the various landings. On his side the defendant protested that the water-supply came direct from the main and was adequate, and that when he provided taps on the landings they were liable to be meddled with by children, with consequent damage to the house. Such an incident would bring down the ceiling of the floor below and the landlord would find himself compelled to restore it at his own expense. The defendant, in enlarging upon this theme, grew eloquent as to his liability for rates and taxes, and dwelt upon the fact that he could be compelled to pay these, including poor-rate and water-rate, without having any power himself to enforce the payment of his rents. The magistrate suggested that a public platform was a fitter place for the airing of grievances of this class than the police court, and made orders to the effect that the conditions complained of by the borough council should be remedied. In this case the landlord is entitled to some sympathy. Many owners of tenement houses would be willing to do more for the benefit of their tenants if the latter would respond by taking proper care of the conveniences provided. On the other hand, no one is compelled to be a tenement landlord, and in such an instance as that quoted above the provision of a fitting water-supply is not limited necessarily to a tap on a landing which any child may play with and leave running. Taps may be so arranged that children are unable to interfere with them, and provision may be made for waste water to be carried off without inflicting damage even if the taps are left running. It is largely a question of how much a landlord may think fit to spend, and the difficulty arises, no doubt, from the fact that tenants of dwellings for the poorer class of working-men are often horribly wasteful and destructive of property not their own. Landlords find that letting houses divided into tenements is a profitable investment, but that an increased expenditure on sanitation does not imply a better return in the way of income. It is difficult, if not impossible, under present conditions, to make satisfactory dwellings for the poorer inhabitants of large cities lucrative to those capable of investing capital in them; but, on the other hand, many families who now afford examples of overcrowding in filthy and insanitary homes might be furnished with better accommodation if they would be persuaded to coöperate with those providing this accommodation so as to render it a less unprofitable speculation.

## FELT AND ANTHRAX.

THE Chief Inspector of Factories has issued an important document which contains reports on the manufacture of felt with special reference to the danger of anthrax, the elimination of blood-stained material, and the use of Cape wool, by Mr. H. Verney, H.M. Inspector of Factories, and Dr. F. W. Eurich, bacteriologist to the Anthrax Investigation Board of Bradford and District. It is pointed out that the continued incidence of anthrax among persons employed in the felt and heavy woollen industries, and the discovery by Dr. Eurich of anthrax spores in a sample of Cape wool, necessarily raise the question of possible elimination of blood-stained material, and improved methods of dust removal, in the early stages of manufacture. In the reports now issued stress is laid on the advantage to be gained by the use of (1) a dust-extracting machine with automatic feed and delivery, in place of the form still frequently found, in which a hinged quadrant has to be let down by hand and lifted up whenever material is shaken; and (2) a centrifugal dust collector in place of the receptacles now generally provided. In regard to fallen fleeces (the fleeces of the fallen animals as distinguished from those killed by the butcher), Dr. Eurich suggests that it should be possible without impeding the fellmonger's work to prelude the usual series of processes employed by him with a 24 hours bath in some disinfectant.

## THE VIABILITY AND POSSIBLE VARIATION OF THE BACILLUS TYPHOSUS.

SOME interesting observations upon certain characters of the bacillus typhosus are recorded by Major W. H. Horrocks, R.A.M.C., in a suggestive paper published in the *Journal of the Royal Army Medical Corps* for March. Some of these experiments were devised to test the viability of the bacillus under conditions approximating to those in nature. The results obtained seemed to indicate that the duration of life of the bacillus typhosus, as at present recognised, is very short. The rapid disappearance of the bacilli from typhoid dejecta, whether intimately mixed with earth or simply covered over, as in a trench, appears to be due to the destructive power of the soil bacteria, and forms a strong contrast to the prolonged life of bacillus typhosus in urine kept in flasks, in which they have remained alive for 14 months. Whenever typhoid urine and fæces gain access to wells, springs, and cesspools, it seems probable that the associated bacteria will cause the typhoid bacillus to disappear in a few days. The bacillus coli seems to be very powerful in effecting this disappearance. Certain other experiments appeared to suggest the possibility of the occurrence of a variation in the bacillus typhosus—i.e., its conversion into an organism of different character. It was found that whereas the toxins extracted by water from the fæces of typhoid carriers did not seem to produce

any changes in the cultural characters of the bacillus, the toxins formed in a mixture of the urine of typhoid carriers with 9 volumes of tap water caused the bacillus to change into an organism having a close resemblance to the bacillus fæcalis alkaligenes. Intraperitoneal passage through a series of guinea-pigs did not convert this organism back again into the bacillus typhosus, but a bacillus having many of the characters of bacillus coli appeared. These observations obviously require extended repetition before they can be accepted as demonstrating variations in the typhoid bacillus, and indeed Major Horrocks points out a possible source of fallacy—viz., that the bacillus coli obtained in the passage experiments in the guinea-pigs may have escaped from the intestine owing to changes set up in their coats by the organisms injected into the peritoneum. At the same time he gives reasons for discarding this explanation. The observations are of considerable theoretical and practical value, and we await the results of further experiments on these lines with interest.

## A REMINISCENCE OF AN IRISH GIANT.

PERSONS living at the beginning of the nineteenth century were often able to relate interesting reminiscences of the giants who peopled the earth during their youth. English memories of the end of the eighteenth century, though often sensational, are none the less frequently worthy of credence. An amusing chapter of anecdotes concerns a giant, Patrick Cotter of Kinsale (1761–1806), who has often been confused with his better-known predecessor the "Irish giant," whose skeleton adorns the Museum of the Royal College of Surgeons of England. Cotter, indeed, exhibited himself under the name of the Irish giant, and was known as Charles O'Brien. A "Northampton Tonsor," writing in *The Mirror*, a popular magazine, in 1827, describes the visit of Cotter to Northampton towards the end of the eighteenth century. He was then in his seventeenth year, remarkably healthy-looking, of a mild disposition, and 8 ft. 7¾ in. in height. "After the exhibition of the day, and when the dwarfs of Northampton had retired to their cribs, this proud giant of the earth would take his morning walk, measuring with amazing strides the distance between the George Inn and Queen's Cross." The barber trotted behind him at full speed, and the giant now and then paused to light his pipe at a lamp-post. He was a conversationalist and humorist, and his intelligence was above the average. He slept in two beds, placed end-to-end. After exhibiting himself for some years he retired from the show business and died at Clifton at the age of 46. He is buried at Bristol, and the rumour of his grave turns up periodically in the provincial press as though to dispute the authenticity of the skeleton of Charles O'Brien or Byrne, which John Hunter macerated and preserved in his famous museum. The period of the French Revolution produced also in France its tale of various monsters, but minds at that turbulent time were ready to believe anything.

## THE REAL TEST OF VACCINATION.

NOWHERE more than in communities that offer a virgin soil for small-pox do the beneficent effects of vaccination stand out with remarkable distinctness. The reason is not far to seek. The issue in such cases is not confused by any such side issues as partial protection, worn-out vaccination, the respective shares of long-continued sanitation and vaccination, and so on. It is a clearly defined issue between the results of the epidemic among those people who have never been vaccinated and those who are efficiently vaccinated sufficiently in advance of infection for vaccination to become operative as a preventive. Such an instance is afforded in a recent report (with a copy of which we have been favoured) by Dr. Victor G. Heiser, Passed Assistant Surgeon, United States Public Health and Marine Hospital Service, and Chief Quarantine Officer of the Philippine Islands. Dr. Heiser says: "During December, a person afflicted with small-pox was transferred from San Jose, Antique, to the island of Caluya, which is a small isolated island south of Mindoro, the inhabitants of which have heretofore not been systematically vaccinated. An old woman took some of the contents of a pustule from the small-pox case shortly before death and commenced to vaccinate [inoculate] a number of the inhabitants; small-pox in epidemic form soon resulted. The population of Caluya and nearby islands is about 2000. Approximately, 1000 cases of small-pox occurred before the facts became known to the outer world. Vaccinators properly equipped were immediately sent to Caluya. They vaccinated 800 of the remaining 1000 persons. Of these, not one contracted small-pox who had a successful vaccination that was two weeks old. The undersigned [i.e., Dr. Heiser] visited 10 families, ranging from five to eight in number. In six of these every member was stricken with small-pox. A physical examination showed that they had no vaccination marks. In two other families six persons were stricken and two escaped. A physical examination showed that of the six stricken members not one had been vaccinated. The two remaining members had successful vaccination marks. Upon inquiry it was learned that they had visited Calapan a year previously and were vaccinated while there. In two other families that lived in the midst of a small-pox stricken village there were no cases of small-pox. A physical examination showed that they had good vaccination scars. Further inquiry elicited the statement that they had but recently come from another island where they had been vaccinated. In one house one person was found with varioloid. Upon inquiry it was learned that he had been vaccinated during childhood. Net result: Community of 2000 population; 1000 unvaccinated persons contract small-pox; 400 die; 800 are protected by vaccination; no cases occur after the incubation period was passed; no deaths occur. The remaining 200 are semi-civilised and fled from the vaccinators, and their condition is unknown." This is only one of the object-lessons that the Philippine Islands, under the administration of the United States Government, have afforded us as to the protective value of efficient recent vaccination against small-pox. We cannot hope that it will influence those opposed to vaccination, but it should nevertheless be put on record and published as widely as possible.

## WIND INSTRUMENTS AND LONGEVITY.

WITHOUT any definite grounds pathologists have ascribed to the blowing of wind instruments injurious effects on the heart and lungs. In the *Yale Medical Journal* for February, Dr. James F. Rogers states that he investigated the subject a few years ago and found that this teaching is not correct, and that there is no evidence that emphysema of the lungs is produced, or that there is any increased proclivity to tuberculosis or other pulmonary affections among performers on wind instruments. He also could find no evidence of any bad effect on the heart. Since the publication of these facts Dr. Forcheimer, in his "Prophylaxis and Treatment of Internal Diseases," has stated that "just as many players of stringed instruments have emphysema as players of wind instruments," and after a long experience of musicians he has come to the conclusion that "neither emphysema nor its predisposition is a result of their occupation." To determine statistically the effects on longevity of playing upon wind instruments Dr. Rogers consulted Grove's "Dictionary of Music and Musicians" and Champlin's "Cyclopædia of Music and Musicians," and calculated the average age of

100 performers upon wind instruments and of a like number upon stringed instruments. The average length of life of players upon wind instruments was 63·5 years and of players upon stringed instruments 62 years. Of the former, 34 per cent. reached ages above 70 years. For the different wind instruments the average ages were as follows: flute, 61·2 years; oboe, 63 years; bassoon, 63 years; horn, 64·4 years; clarionet, 65·2 years; trumpet and cornet, 69·1 years. It is interesting that the players on wind instruments who exert the greatest intrapneumonic pressure—namely, performers on the trumpet and cornet—were the longest lived, while the players who exert the least pressure, the flautists, were the shortest. Dr. Rogers does not attribute the greater longevity of the former to the higher pressure, but to the facts that the more vigorous would be apt to take an instrument requiring much effort, and that only such as could make a mark as virtuosi would secure a paragraph in an encyclopædia. A consumptive, like Sidney Lanier, might be a brilliant flautist, but no consumptive could make a fine clarionetist or trumpeter. These figures therefore refute the current teaching that playing upon wind instruments tends to shorten longevity. It appears to have been assumed that the high intrapneumonic pressure during blowing, which may exceed 100 mm. of mercury, would tend to cause emphysema. But the fact is overlooked that this pressure is counterbalanced by the pressure of the chest walls on the lungs.

## PNEUMOTHORAX WITH ACUTE ABDOMINAL SYMPTOMS.

THE fact that it is easy to mistake thoracic for abdominal disease was well known to the older physicians, but dropped out of notice in recent years until attention was called to it in a paper published in our columns by the late Mr. H. L. Barnard, entitled "The Simulation of Acute Peritonitis by Pleuro-Pneumonic Diseases,"[1] a communication which did much to make the reputation for originality achieved by its author in his too short career. He reported cases in which pneumonia, pleurisy, and pyopneumothorax simulated appendicular peritonitis. The fact that the six lower dorsal nerves supply the abdomen as well as the chest explains the occurrence of abdominal pain in chest disease. In the *New York Medical Journal* of March 18th Dr. E. J. G. Beardsley has reported a case of pneumothorax in which the onset was attended with violent abdominal symptoms simulating perforative peritonitis. A man, aged 26 years, was admitted into hospital in an advanced stage of pulmonary tuberculosis. The right lung was infiltrated throughout, and at the apex were signs of a small cavity. The upper lobe of the left lung was almost completely converted into a cavity, and the lower lobe was infiltrated throughout. The patient was much weakened by attacks of diarrhœa, which were attributed to intestinal tuberculosis. One day he was seized with severe pain in the left side of the abdomen opposite the umbilicus. He was seen two hours after the onset and found sitting in bed with his head bent forward between his knees and groaning. He was covered with cold perspiration, and his face had an expression of intense suffering. He said that the pain developed suddenly, and felt as though a knife had been thrust into the abdomen. He indicated a spot near the umbilicus where the pain began, but said that subsequently general pain in the left side of the abdomen developed. The temperature was subnormal and the pulse was 140. There was no dyspnœa and the respiration was only slightly quickened. Satisfactory examination was not possible in consequence of the patient's restlessness and fear of additional pain being produced by any change in position. It was easily ascertained, however, that the left side of the slightly distended abdomen was more rigid than the right, and that the slightest pressure on it caused severe pain. Half a grain of morphine was given hypodermically. An hour later the patient was comparatively free from pain, although any movement of the abdomen caused distress. The abdomen was much distended and rigid, particularly on the left side, and was tender all over. Rupture of a tuberculous ulcer was suspected, but the general condition negatived any operation. Death occurred two days after the onset of acute symptoms. During this period the patient remained in much the same condition except that the abdomen became slightly more distended. At no time was there dyspnœa. The necropsy revealed many tuberculous ulcers of the intestine, but none of them had perforated nor was there any evidence of peritonitis. An explanation of the acute abdominal symptoms was found in an extensive left pneumothorax. The fact that there was little fluid in the pleural cavity confirmed the view that it was recent. The heart was considerably displaced to the right, the apex corresponding to the left lateral sternal line. Had even a casual examination of the chest been made the abnormal position of the apex beat would have been discovered, but Dr. Beardsley was misled by the severity of the abdominal symptoms. It is of interest in connexion with this case that in a recent article on "Pneumothorax in Pulmonary Tuberculosis," published in the fifth annual report of the Henry Phipps Institute (for the study of tuberculosis), the late Dr. W. B. Stanton stated that of 61 cases of pneumothorax in pulmonary tuberculosis abdominal pain was not reported in one, and in only one case was the patient free from dyspnœa.

[1] THE LANCET, August 2nd, 1902, p. 280.

## THE PHYSICAL ANTHROPOLOGY OF THE ABORIGINAL AUSTRALIAN AND TASMANIAN.

THE Tasmanian as a race is dead, and even the much diluted blood of this very primitive people has practically ceased to exist. The Australian "black fellow" will not improbably follow in the wake of the Tasmanian, for the race is neither likely to multiply in its purity nor to be kept alive by any extensive assimilation with other races. It is therefore a useful work to collect all the data available concerning these people; they will afford permanent records of what is already gone, and material for the study of what remains. To these ends the Melbourne school have fortunately directed their attention, and Professor R. J. A. Berry has made a wise choice in the line of research work for his department in electing to unearth and record all the data available to-day. Four papers have recently appeared in the Proceedings of the Royal Society of Edinburgh as the first-fruits of this research.[1] They deal with the place occupied by the Tasmanian aboriginal in the great assemblage of higher primate types and with the biometrical study of certain craniological data. The anthropological portion of this work is by Professor Berry and Dr. A. W. D. Robertson, while Mr. K. Stuart Cross is responsible for the mathematical handling of the data. The results may be summed up briefly in the authors' words, that "of recent man the Tasmanian stands nearest to Homo fossilis, but morphologically has progressed a very long way from

[1] Proceedings of the Royal Society of Edinburgh, vol. xxxi., Part I., Nos. 1, 2, 3, and 4.

Homo primigenius and the anthropoid apes—very much farther than most writers would seem to believe." With regard to the purity of the Tasmanian stock in relation to its nearest kindred, the authors conclude that biometrical investigation proves that the Tasmanian is purer than either the Australian or the Papuan; the Papuan is least pure, and the Australian is about midway between the two. These conclusions are highly suggestive and of great interest, but we fancy that, as regards the judgment of the future, more value is to be attached to the careful collection of data than to the drawing of these inferences; and this we say with all due deference to the judiciously weighed deductions of the authors. Especially would we commend the careful compilation of dioptographic tracings of Tasmanian crania. Professor Berry has the credit of bringing to the notice of the scientific world 42 hitherto unrecorded skulls, and his accurate outlines in four normæ of the entire series of known Tasmanian crania form a work of great and permanent utility. The patient recording of these details in an easily accessible form possesses the great merit that, as fresh knowledge accrues, new deductions may be drawn from these accurate data. Were a further proof wanted for the utility of this work, it need only be said that the bulk of these Tasmanian crania are in the possession of scattered and, for the most part, non-scientific individuals, and their destiny is in a high degree uncertain. The Melbourne school has put its hand to the plough and is to be congratulated on the furrow it has already turned up; it is to be hoped that it will not turn back, for it has started a work of real usefulness and one begun none too soon.

## INFANTILE MORTALITY IN EGYPT AND THE NATIVE PRACTITIONERS.

THE very high rate of infant mortality in Egypt must be a matter of deep concern to all who are interested in the prosperity of that country. The chief causes are, as usual, poverty and ignorance. Yet bad as matters are they would be infinitely worse but for the excellent precepts of the Koran. The religion of Islam distinctly teaches that it is the duty of mothers to suckle their children. Thus, among the native Egyptians it is only after the age of 10 months that the high infant death-rate begins. By that time the babies commence to cut their first teeth, and then the mothers imagine that they may give other food than milk to their children. European mothers are not so strict in suckling their children, and deaths before the age of 10 months are therefore much more frequent among the non-Mussulman population. In Cairo, where there is a very large European population, of every 1000 deaths occurring in 1908, 1909, and 1910 the infants numbered 368, 382, and 378 respectively. The infant mortality is not quite so high at Alexandria. The most favoured towns in this respect are Damietta and Port Said, while the highest infantile death-rate prevails at Benda, Damanhur, Fayum, and Beni Suef. The first great need is to instruct mothers in the duties of motherhood. Obviously this can hardly be done by medical men, nurses, teachers, and other persons who, however well qualified, belong to an alien race, and do not know the native language or profess the religion of the country. Fortunately, some of the native practitioners have taken the matter in hand, and established an Egyptian Society for the Protection of Childhood with a hospital at Darb-el-Ahmar. Here the gynæcological surgeon, Dr. Hafez Afifi, and a qualified midwife, explain to the patients what are their duties as mothers, and insist on their bringing the infants periodically back to the hospital so that they may be medically examined. The result is that, at least among these infants, the rate of mortality was only 50 instead of from 300 to 400 per 1000. On his side Dr. Abd El-Aziz Nazmi Bey is delivering lectures and writing papers for the same purpose, that of popularising among the native inhabitants what modern science teaches in regard to saving infant life. But he urges that his efforts and the help of a few friends cannot suffice. The lessons all must learn should be embodied in a general scheme of education. Schools are being established for the elementary and the higher education of girls in Egypt. Dr. Nazmi Bey is anxious that before teaching art embroidery, piano-playing, or even foreign languages, these young women should be prepared for the duties and responsibilities of motherhood. It is difficult to find any objection to such obvious and just sentiments. We have, on the contrary, to rejoice, not merely at their utterance, but more especially at the fact that it is the Egyptians themselves, the people who are most concerned, who are awakening to their own best interests, and are taking up at least this phase, and it is a very important phase, of the general cause of sanitary reform.

## THE PEABODY DONATION FUND.

THE annual report of the Peabody Donation Fund for the year 1910, which has just appeared, is full of hopeful promise of increasing provision of improved dwellings for the working classes in London. It has certainly been somewhat disappointing to note that during the past 20 years (1890–1910) the aggregate population housed in the dwellings provided by the governors of the fund has practically remained stationary at about 20,000. The report for last year, however, states that recently erected blocks of buildings at Islington, Herne Hill, Cambridge-circus (Bethnal Green), and Glasshouse-street (Whitechapel) were at the end of the year completed and nearly fully occupied; that good progress had been made with nine blocks of tenement buildings at Camberwell Green, which will probably be ready for occupation early in the summer; and, further, that three new sites have been purchased at Lillie-road (Fulham), Rodney-road (Walworth), and Vauxhall Bridge-road, with an aggregate area of 20,732 square yards, on which about 30 blocks of buildings are to be erected. It may therefore be fully anticipated that the aggregate metropolitan population housed in improved dwellings through the agency of the Peabody Fund will be very considerably increased in the near future. It is not easy to over-estimate the possible future effect of this fund on the housing of the poor in London. The original princely donation and bequest by Mr. Peabody of £500,000, supplemented by a bequest of £27,887 by the late Mr. Henry Fox, and by the aggregation of £1,193,401, as net income from rents and interest, had raised the total capital of the fund to £1,721,288 on Dec. 31st last—more than three times the original donation and bequest. The fund, with its accumulations since 1873, has shown an average increase at a compound rate of interest just under £3 per cent. The balance of net income from rents and interest added to the capital of the fund during last year was £39,678, equal to £2·36 per cent. on the capital of the fund; in 1890 the addition to capital from rents and interest did not exceed £28,656. At the end of last year the governors had provided for the artisan and labouring poor of London 13,891 rooms, comprising 5853 separate dwellings, and the mean population housed in these rooms during the year was 20,556. The population residing in the Peabody Buildings on Dec. 31st, 1890, was 20,462. In view of the recently issued report it may reasonably be expected that the governors of the fund will be able to report at the close of the current year a large increase in the population housed through the agency of this steadily increasing fund. Bearing in mind the social grade of the

population housed in the Peabody Buildings, the statistics published in the report under notice afford conclusive evidence of the beneficial effect of these improved dwellings on the health of the residents.

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A CONVERSAZIONE will be given by the Medical Society of London on Monday evening, May 15th, in the rooms of the society at 11, Chandos-street, Cavendish-square, W., at 8.30 o'clock. After a reception by the President an oration will be delivered at 9 o'clock by Dr. William Pasteur, on "Post-Operative Lung Complications." Music will be provided by the Blue Viennese Orchestra.

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THE annual general meeting of the Medical Defence Union will be held at the Grand Hotel, Brighton, on Thursday, May 18th, at 4.30 P.M., when the annual report of the Council for 1910 will be duly presented to members.

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THE Duke of Northumberland, as President of the Royal Sanitary Institute, will preside at the annual dinner of the Institute to be held on May 18th at the Langham Hotel.

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Mr. Samuel Knaggs, the *doyen* of the medical profession in Huddersfield, died on Sunday, April 23rd, in the 83rd year of his age.

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A REPORT ON

# THE SEPTICÆMIC AND PNEUMONIC PLAGUE OUTBREAK IN MANCHURIA AND NORTH CHINA

*(Autumn, 1910—Spring, 1911).*

BY G. DOUGLAS GRAY, M.D. EDIN.,
PHYSICIAN, H.B.M. LEGATION, PEKING.

IN the compilation of this report I lay small claim to originality. It is mainly *une mise au point des notions acquises*. The consuls of Manchuria and Shantung have kept us well informed during the whole course of the epidemic, and the Russian and Japanese Legations have forwarded information they received. Dr. W. H. G. Aspland, Dr. Young, Dr. J. G. Gibb, and Dr. Hill have from time to time communicated their medical observations, and the Wai Wu Pu and Minchengpu have both sent news of the progress of events. Part of the epidemiological notes have been extracted and compiled from various reports relating to plague published in THE LANCET during the past few years. From the foregoing it will be seen that the data are from trustworthy sources.

## GENERAL FEATURES OF THE EPIDEMIC.

This outbreak of pneumonic and septicæmic plague has been remarkable for the straightforward course it has pursued. Beginning in autumn, at a definite focus in North-west Manchuria, at a time of the year when Shantung labourers who annually come north return to their homes (partly for want of work during the winter and partly to be in time for the great national New Year festival), it was taken by these men throughout Manchuria and the provinces of Chihli and Shantung. There were various unforeseen checks on the way and at these points the epidemic gained more virulence. It is not difficult to trace the course of events. Each station down the line on the way to Harbin became infected, as also were various towns and villages north and south of the Sungari.

Harbin, the junction where the track turns south, was crowded (more especially the Chinese town of Fuchiatien) with these homeward-bound gangs of coolies. The lack of sufficient preventive measures made the railway area and Fuchiatien thoroughly infected; then a new focus of infection appeared at Chang-chun. Here, owing to an absence of arrangement between the two railway companies, there was a check. As a temporary measure, pending the completion of quarantine stations that had been immediately taken in hand under great climatic difficulties, the South Manchurian Railway Company stopped taking coolie passengers further south. At the same time they were still being brought to Chang-chun by the Chinese Eastern Railway Company, with the consequence that the mass of "held-up" coolies was considerably augmented and became more and more infected, till the Chinese Eastern Railway Company stopped bringing them south. Numbers of these men managed to reach Mukden, from where they were able to join the south-bound trains. In one of these trains containing 400 coolies plague broke out. This train, on being sent back to Mukden, quickly made that town the third chief focus of infection.

In the meantime, by road and rail, many of the coolies found their way south-east through Kirin province, and passing through Dairen and infecting it *en route*, sailed by steamer, junks, and boats across to Chefoo, where numbers of them died. Others were able to spread through the province to their various villages, which in turn became infected.

From Mukden a proportion were taken south through the Great Wall by rail, but many passed down as foot passengers. Arriving at Tientsin they lost but little time in joining the Tientsin-Pukow line, and passing on by it, dying on the trains and at its stations, they carried infection as far as Tsinanfu and their home villages. A man from Harbin carried infection to a village south of Paotingfu on the Peking-Hankow line, and from there—and probably from other sources—various villages in Chihli were infected. In almost every case the infection was traced to travellers from Manchuria.

The port of Newchwang escaped. Labour coolies do not go north from Newchwang. Neither do Shantung coolies use this port on their return journeys, as it is frozen during the winter months. Chinwangtao escaped, too, the coolies using Dairen as their port in their endeavour to reach Shantung *viâ* Chefoo. Those who lived in Western Shantung and Chihli made for the Tientsin-Pukow Railway. Tientsin also escaped (only 65 deaths), as its population find sufficient employment without having to migrate north annually. The travellers therefore, not having their homes in Tientsin, passed through it as quickly as they could, travelling, as is their wont, *en masse*, in south-bound coolie trains. In addition the authorities were given sufficient warning to set their house in order, and the few cases and their contacts that developed in Tientsin were dealt with in isolation hospitals and segregation houses as soon as they occurred. Tongshan escaped for much the same reason as Tientsin. Although it is a crowded town its people find work in the mines, &c., and do not contribute to the migratory horde of coolies. The same reasons account for the comparative freedom of Peking, where not more than 17 known deaths occurred.

A fortunate circumstance of this epidemic was the absence of rat plague. Tracing the chain of infection was thereby made infinitely easier. For instance, in Tientsin and Peking, where the authorities had sufficient timely warning to form a preventive sanitary brigade and erect the necessary segregation buildings, the epidemic showed itself much more amenable to management than has been found the case in places where there were epizoötic complications. Naturally a plague-stricken rat and its contacts are more difficult to trace than a plague-stricken man. There were many instances of escape of human contacts at the beginning of the epidemic, but with better organised preventive work these became steadily less.

The prevalence of pneumonic and septicæmic cases, and the absence of bubonic ones in this epidemic, depended on sociological as well as bacteriological factors. Extreme cold, huddling together on k'angs, rooms closed to all ventilation, with every draughty crack sealed with paper—economics practised by the poorer classes during winter, when they are all more or less out of work, in their endeavour to replace the cost of heating by accumulation of human animal warmth—uncleanly habits, insanitary surroundings, are all in favour of conveying infection from man to man. It is, therefore, not difficult to see how a virulent plague pneumonia, which in tropical or more open-air surroundings is not more than a small incidence in plague epidemics, finds ready ground for becoming a general pathogenic type, its virulence being increased by passage from lung to lung until ultra-virulence is obtained. We thus see this virulent bacillus pestis in cases where it has not attacked the lungs taking on the septicæmic form of plague, the glands being powerless to hold back the toxin, as occurs in bubonic plague.

Very little work has so far been done in primary plague pneumonia to establish its bionomics, and in particular its relationship to the more common form of the disease, but there seems little reason to doubt that the organism of the Manchuria epidemic possessed an unusual or "exalted" degree of virulence.

Another noteworthy fact has been the good use made of railway cars as quarantine stations. In Fuchiatien the Russian authorities placed 100 trucks at the disposal of the Chinese Plague Commission, which gave quarantine room for 2000 people. These trucks (stationed on a railway siding) had each a stove in the centre and plank beds. The inmates were turned out every morning, the car was then disinfected by carbolic spray (1-20), and the floors were flooded with 1-1000 corrosive sublimate and then fumigated with 2 lb. of sulphur. On extra-cold days this latter process had to be omitted. The medical men regretted being unable to give each inmate a daily bath and change of sterilised clothing, but the large number of contacts under quarantine (sometimes over 1400 at a time) made it impossible, the time being fully employed in the work of medical inspection of each inmate and the sending to hospital of those who had developed plague.

The Central Government throughout has risen to the occasion and no expense has been spared to carry through the various necessary measures. The dismissal from their posts of officials who were found incompetent to grapple with the situation, the appointment of more energetic men in their place, the sending of letters and telegrams to the staffs in infected areas urging them to do their best, and the willingness throughout to follow methods approved by modern science have done much to curtail the spread of the epidemic. Perhaps I may be permitted to give publicity to the sentiments of those medical men engaged in plague work by mentioning specially the name of the Hon. Saoke A. Sze, who has been the medium, as far as dealings with the Central Government were concerned, through which the medical men have worked. This official showed himself ever ready to act promptly as each emergency arose, and it is mainly due to the spirit of friendly coöperation with which he infused the various anti plague staffs that difficulties have been surmounted. In response to representations from Dr. Wu Lien-Teh, Mr. Sze, on behalf of the Central Government, sent official permission for post-mortem examinations to be made on unclaimed corpses. This marks a new and distinct step forward in the path of scientific elucidation of disease problems in China. Consular and medical reports from Manchuria frequently testified also to the able interest in plague affairs taken by the Viceroy Hsi Liang.

With regard to the clinical symptoms, the incubation period was in the vast majority of cases five days. There were no marked prodromal symptoms. Often a man had a normal pulse and temperature and the next day was dead. Usually there was a feeling of illness with weakness and giddiness. As regarded invasion there was no initial rigor, but usually a sudden onset with headache, and often there were bloated face and suffused conjunctivæ—a sort of septicæmic cyanosis—with raised temperature (usually over 103° F.) and fast flattering pulse. Many were able to walk about until within a few hours of death, declaring that they felt quite well. Coarse crepitant râles were heard all over the chest with resonance only slightly impaired. The respirations averaged about 35 per minute. Usually blood-stained sputum is the first symptom in pneumonic cases, and the differential diagnosis between these and septicæmic cases relies on the absence of bloody expectoration coupled with the fact of rapid death. The lung symptoms, ranging from bronchitis to broncho-pneumonia, are invariably associated with evidence of septicæmia. The later stages of the illness are marked usually by agonising dyspnœa. In many cases it is impossible to say whether a case is pneumonic or septicæmic till shortly before death, when there may be only a flow of blood from the mouth or nose for a few minutes. In purely septicæmic cases there is intestinal hæmorrhage, in addition to the rapid course of the illness.

From the above symptoms it might perhaps be more correct to describe this epidemic as one of septicæmic plague and to look upon the lung symptoms as secondary and due to injury of the vessels of the lung, the toxin causing a bloody œdema of the lungs. No glandular enlargements have been noted except in one case at Harbin in which there was a submaxillary bubo, followed by secondary plague pneumonia and death. At the same time, in many cases in which the bacilli are found abundant in the blood films, there are no symptoms of lung involvement. In 11 consecutive cases Dr. P. Haffkine, working at Harbin, found bacillus pestis in the blood of 7 microscopically, and in all 11 culturally.

*General Note on Manchuria.*

Manchuria, a region equal in grand area to France and Germany combined, is divided into three provinces (hence the appellation "the Three Eastern Provinces"). The southernmost province, Fengtien, which is the smallest, has by far the greatest population of the three—probably 10,000,000. The central province, Kirin, which is the richest, has some 6,000 000; and the vast north-western province, Heilungchiang, not more than 2,000,000 or 3,000,000. Fengtien province has been long settled by Chinese. Parts of this province were under cultivation during the Ming dynasty—i.e., at least 300 years ago; but it is only during the nineteenth century that Kirin and Heilungchiang have been given over to Chinese immigration. Though Manchuria is actually Chinese territory the dominion exercised over it by the Chinese is not complete, for two large stretches in the three provinces are under foreign jurisdiction, being governed by Russia and Japan respectively. The sovereignty of China is represented by a Viceroy, who is also an Imperial Commissioner, resident at Fengtien (Mukden), with yamens in the other two provinces, for convenience of government, having under him three governors residing at Mukden, Kirin, and Tsitsihar. The Peninsula of Liaotung, the lease of which was transferred from Russia to Japan after the war, is administered by a Resident-General who acts under the orders of the Foreign Office at Tokio. There is also a Japanese Resident-General at Mukden, for the benefit of the large number of his nationals living there.

In 1896 there was a Russo-Chinese Railway Convention which gave Russia the right to build a "quick route" straight across Manchuria to Vladivostock. In 1898 by the Port Arthur agreement China ceded to Russia the right to extend her railway system southwards to the sea from the central point of the Trans-Manchurian Railway—Harbin. By the Treaty of Portsmouth Russia ceded to Japan Port Arthur and the railway up to Kuanchengtze (Changchun). The chief point about this system from the politico-sanitary-commercial standpoint is the policing right connected with it. Under the original agreement, in order to safeguard the system against armed robbery by the so-called Hunghutzu, a strip thirty *li* (or ten English miles) broad was granted to the railway company all along the length of its track, in which jurisdiction was exercised by the railway company and policing carried out by its own military police.[1] This right, important enough under the old conditions, has gained greatly in potential importance since the spread of plague, and will require careful study before the difficulties of the adoption of a uniform administrative treatment as regards epidemiology can be appreciated. Constituting, as it does, an *imperium in imperio*, it is a unique railway factor which during the epidemic did not assume any prominence owing to the spirit of friendly coöperation exhibited by the three Powers concerned in all anti-plague measures. At the same time, it will require consideration in the proposal of quarantine measures which will be necessary from now onwards in dealing with the many thousands of coolies who are annually required as labourers in the agricultural development of Manchuria.

*Chinese Eastern Railway (Russian control).*—Manchuria-Harbin section, Harbin-Vladivostock section, Harbin-Kuanchengtze section—total length, 1088 miles. This railway is under Russian control for a period of 80 years dating from the commencement of traffic along the whole line. All postal and telegraphic arrangements are under Russian control by the terms of the company's agreement with China, and the company also has the privilege of appointing police agents on railway lands for the preservation of law and order.

*South Manchurian Railway (Japanese control).*—Kuanchengtze-Port Arthur—length, 508 miles. This line was formerly part of the Chinese Eastern Railway system, but in the Treaty of Peace of 1905 was transferred, with all its branches, rights, privileges, and advantages, without compensation and with the consent of China, to the Government of Japan.

*Antung-Mukden Railway (Japanese control).*—This railway is 128 miles in length and forms a connecting link between the Corean Trunk Railway and the South Manchurian Railway. It joins the latter at Mukden and is at present being widened from a 2½ ft. gauge to the standard gauge of 4 ft. 8½ in. It is entirely under Japanese control.

*Kuanchengtze-Kirin Railway (Chinese control).*—This line, under construction, is about 75 miles in length, and runs east of the South Manchurian Railway from Kuanchengtze (the junction of the Chinese Eastern Railway with the South Manchurian Railway) to Kirin, the capital of the province of Kirin. It is nominally under Chinese control, but the Japanese have the right of appointing the technical and clerical staffs by virtue of their having supplied part of the funds for construction.

*Hsinmintun-Mukden Railway (Chinese control).*—This line, though under Chinese control, is partly financed by the Japanese, who have the right of appointing a portion of the technical and accounting staffs. It forms a connecting link between the Imperial railways of North China and the South Manchurian Railway and is about 35 miles in length. By Article 4 of the Treaty of Peace of 1905 Russia and Japan reciprocally engaged "not to obstruct any general measures, common to all countries, which China may take for the development of the commerce and industry of Manchuria."

## TARABAGAN DISEASE.

It has been known for many years past that in Eastern Siberia and Mongolia the marmot or tarabagan (Arctomys bobac), which is a variety of ground beaver also called the jumping hare, suffers frequently from a fatal disease which may be transmitted to man and produce in him symptoms indistinguishable from those of bubonic or pneumonic plague. The tarabagan is exported in large quantities to European

[1] This right has been surrendered, according to information received from the Chinese Foreign Office.

Russia, where it is used for the purpose of imitating sable and other furs. Though found throughout the mountains of Asia, one of the most favourite haunts of this animal is in North-west Manchuria, in the mountainous range between Tsitsihar and Khailar. Large numbers of Chinese are employed trapping it during the summer months, and the Chinese population in the neighbourhood of Manchuria station, which stands normally at about 3000, is during that season of the year augmented by some 5000. It was among these trappers that the present outbreak is held to have originated. While clinically the "tarabagan disease" in man is evidently plague, bacteriological proof that the two diseases are identical has hitherto been wanting, and Russian medical journals have from time to time called for further investigation of this point.

At the end of 1905 and beginning of 1906 Dr. M. T. Schreiber (who died in 1907 from plague contracted in the Government laboratory situated on a fortified island near St. Petersburg) was sent by the Russian Government on a scientific expedition to the infected region. He really made two expeditions separated by a short interval; the second alone occupied two and a half months, and covered about 1000 miles of ground. Unfortunately, on neither occasion was he able to observe cases of the disease either in man or animal, apparently owing to the fact that this disease breaks out only in autumn and disappears for the rest of the year. From information derived on the spot, however, the details of a considerable number of outbreaks in man or in the tarabagan, or in both, were collected and set forth in the Russian medical journal, the *Vratch* (1907, No. 9). These outbreaks resembled in every respect those already reported by other observers, and the details, while interesting in themselves, did not unfortunately help to throw further light on the main problem—the true relation of this disease to plague in man. The article concluded with a brief summary of the points which seem to militate for or against their identity; among the latter were noted (1) the undoubted occurrence of these epizoötics without human beings becoming infected; (2) the fact that field mice, which are known to be susceptible to plague, do not contract this disease from the tarabagan, though they have every chance of doing so; and (3) the fact that domestic animals also escape it. Dogs in particular, it was noted, eat greedily and frequently of the flesh of the dead marmots, yet never develop the disease. As the autumn is the only time of the year at which tarabagan disease prevails, it was evidently recognised by the Russian Government that a thorough bacteriological investigation could only be rendered possible by despatching any future scientific expeditions to the infected areas during autumn.

Accordingly we find that in the autumn of 1906 and that of 1907 Dr. B. A. Barykin made expeditions to certain districts known to be infected with the "tarabagan disease." He recorded the following facts in the *Ruskii Vratch*, April, 1909, the details of which closely resemble those of outbreaks previously reported. From the spring to the autumn of 1906 there was a high mortality among the marmots round the settlement of Abogaitui, situated 30 versts from Manchuria station. The inhabitants were fully aware of the danger and avoided all contact with the sick animals, with one exception. This was a Cossack who was in indifferent health and particularly fancied the delicate flesh of the tarabagan. On Sept. 23rd he fell ill with the symptoms of plague and died on the 27th. The disease spread from him to others; in the end eight persons fell ill and all died; in all the symptoms were those of pneumonic plague. Necropsies were made in two cases; the organs were found to contain bacilli indistinguishable from those of plague; mice were injected with juice from the spleen of one and died in 26 hours with all the appearances of having died from injections of Yersin's plague bacillus.

In the autumn of 1907 a large number of marmots were killed or caught by Dr. Barykin's party and examined for the presence of disease. In one of these animals, which showed no external signs of being ill save a general degree of malnutrition, the spleen was found to be swollen and congested, and it contained large numbers of bacilli which presented all the morphological and cultural characteristics of plague bacilli. Later preparations of these organisms were shown to Professor Zabolotny and Professor Savtchenko, both of whom regarded them as in all probability true plague bacilli. A fortnight after the discovery of this infected animal the following incidents occurred in a district 20 versts away. A Cossack family had settled in a lonely and isolated spot where tarabagans abounded. The men amused themselves with hunting the marmots, and one day killed one that showed clear signs of illness. In spite of warnings from the older men they skinned the animals; the body was recognised as unfit for food and was given to a girl aged 13 years to take to the fields and throw it away. This girl dragged the body (weighing about 15 lb., it is said) after her through the grass, and returned to the settlement along the same path. She was barefooted. On the next day she fell ill, a bubo appeared on the left groin, and there were all the symptoms of an attack of plague. She died some days later. From the bubo, from a pustule on one finger, and from the spleen, bacilli indistinguishable from those of plague were isolated; injected into mice they caused death in 18 hours with symptoms of septicæmia. It was impossible to examine the body or skin of the animal. The men appear to have escaped infection. In the same autumn a guard at the station of Khara-nor and a Cossack woman at that of Sharasun both died from a disease resembling bubonic plague; the former had hunted marmots, the latter had skinned the dead animals. Sick marmots had been seen in the neighbourhood in both instances. In the case of the guard the organs were found to contain bacilli which, microscopically, were identical with those of plague. As a result of inquiries elsewhere it was ascertained that in the district round one station only—that of Tsagan-Olnevsk—ten outbreaks of this plague-like disease in man had occurred in the preceding nine years. None of them were very severe, and the people themselves took precautions to prevent its spread.

No other outbreaks, so far as I can ascertain, of tarabagan disease have been recorded until the summer of 1910, when Dr. Boiodin of Akschinsk, who was in the village of Stary Tzuruchaitai, learned from a Buriat who had been a few versts over the Mongolian frontier that on the river Tap some "dreadful sickness," probably the tarabagan plague, was prevalent amongst the inhabitants, and that there were villages where not a single recovery could be recorded among those who fell sick. It is evident that this epidemic had steadily spread eastward, for a consular report of Nov. 24th, 1910, notifying the outbreak which was first observed on Oct. 13th, 1910, among the tarabagan trapping community round Manchuria station, said that up to that date there had not been a single case of recovery out of 300 persons affected by this disease.

Le Dantec, who studied this question,[2] looked upon the tarabagan as being a permanent source of plague enzoötic, and suggested that it automatically propagated the virus to the rat, which in turn affected man. He added that to eradicate plague for ever from the surface of the globe it would be sufficient to declare a war of extermination no longer against the rat, which is cosmopolitan, but against the tarabagan, from which this disease spreads everywhere. But from the foregoing accounts it will be seen that there is very good evidence that the rat has not played the part of an intermediate host. Moreover, there have been many outbreaks of pneumonic and septicæmic plague throughout Siberia and the Kirghiz steppes of similar virulence to the Manchurian epidemic, in which there has been no evidence of the disease being spread by rats.

### NOTE ON NEIGHBOURING ENDEMIC PLAGUE FOCI.

The plague epidemics of Astrakhan and Turkestan have been medically reported as being human infective outbreaks communicated from man to man and without concurrent rat or other rodent plagues. The Manchurian epidemic has possessed the same characteristics as regards human infectivity and pulmonary septicæmic signs as those of Russia and Siberia. Very little definite medical information is available with regard to the recurrent outbreaks in Mongolia beyond the 1898 epidemic there, which was observed by Dr. J. J. Matignon and reported by him to be bubonic plague with one or two cases of secondary pneumonic symptoms. The epidemics of South China have hitherto consistently been connected with rat bubonic plague, and pneumonic cases have only incidentally occurred. The three nearest endemic foci are (1) Russia; (2) Mongolia (indefinite); and (3) South China.

1. *Western and northern sources.*—In 1908 the Russian Imperial Plague Commission issued a volume dealing with

[2] La Pathologie Exotique.

the subject of plague outbreaks in the country about the mouths of the Volga, in the Astrakhan government, in the Kirghiz steppes, and adjoining regions. In the first section an account is given, so far as it is known, of the records of plague in these regions down to the famous epidemic in Astrakhan in 1877 and that in Vetlianka and other villages on the Volga in 1878–79. The authors believe that before the nineteenth century the historical plague outbreaks in Russia always had their origin in the West and that the Astrakhan border played no part in their etiology and spread. On the other hand, in the two principal epidemics of the nineteenth century, those of 1807–08 and 1877–79 the disease undoubtedly came to Russia through these regions. The Astrakhan and Vetlianka epidemics they believe to have been caused by an imported infection from the endemic centres of plague in Mesopotamia. Those outbreaks were thought to have been the last in Europe before the date of the recent revival of the disease in China and India and in more or less pandemic form through a great part of the world.

From time to time epidemics appeared some of which were unrecorded till some years later, in 1899, the Kolobovka outbreak occurred, and it was recognised that the mortality of these previous epidemics must have been due to the same cause. Kolobovka is a village in the Tsaref district of the Astrakhan government. The disease, described as "a very infectious form of pneumonia," appeared on July 16th, and between that date and August 12th there were 24 cases with 23 deaths, only one person, a woman aged 51 years, recovering. By this time plague was becoming once more a known disease; the bacillus had been identified and diagnosis was relatively easy. Material from these cases was examined by experts and was found to contain the Yersin bacillus.

In the same year plague broke out in three islands at the northern end of the Caspian Sea. In one 25 were attacked and 22 died; in the other two islands, out of a population of 64, 39 were attacked and all died. This outbreak was said to have been "apparently of the pneumonic variety." In 1900 the existence of a fatal disease was reported from the Talof region of the Inner Kirghiz horde, 40 versts from the station of Alexandroff-Gai. The disease was apparently pneumonic plague; neither petechiæ nor buboes were seen in a single case. Necropsies (made in 14 cases) and bacteriological examinations showed that the disease was pneumonic plague with, in some instances, a mixed infection of the plague bacillus and the pneumococcus. In March, 1901, an outbreak of plague was discovered in the village of Alexandira, in the Novoüzensk district of the Samara government immediately adjoining the above-named Talof district of the inner horde. In 1902 two more outbreaks occurred in these regions. In 1903 it appeared in the village of Buikof in the Tsaref district. The diagnosis of plague (bubonic) was confirmed by bacteriological inquiry. Anthrax (also proved bacteriologically) was prevalent at the same time, a fact which had been noted in the 1901 epidemic. In 1904 a much more serious outbreak occurred in the Gurieff district of the Uralsk province on both sides of the Ural river. Between Nov. 1st, 1904, and Jan. 4th, 1905, 415 deaths occurred.

In 1905 an even more deadly epidemic broke out in August in the Primorskia (maritime) districts of the Astrakhan government. Approximately it was estimated that 565 persons fell ill and 527 died. The proportion of cases to the whole population was 65 per cent.

From the foregoing accounts it is clear that the stretch of country about the mouths of the Volga and Ural rivers must be regarded as a true endemic area of plague. Although the practical difficulties in the way of stamping out the disease in this area are very great the Russian authorities have done much to lay the foundations of practical remedial measures.

In none of the plague epidemics above described was there evidence of the disease being spread by rats or other rodents. At the time of the Kolobovka outbreak 4128 different animals (including rats, mice, bats, marmots, snakes, and many domestic animals) were examined, and in none of them was the plague micro-organism detected. In the Vladimirovka outbreak and in those at Tekebai-Tubek and adjoining places inquiry was specially made as to the occurrence of mortality among rats, and in both with negative results. The authors of the report consequently came to the conclusion that rats and rodents have not played any part in the spread of plague in these regions, though they are careful to add that the evidence is only presumptive and incomplete and that caution is necessary in coming to an absolutely negative conclusion.

These Russian official records do not go beyond 1905, but notwithstanding the above conclusions plague was evidently occurring in Eastern Siberia, in Ussuri, and Mongolia among the marmots as well as the people, as has been shown in the notes on tarabagan disease.

In the summer of 1906 an outbreak was reported among the inhabitants of the Kirghiz steppes of the Astrakhan government.

In 1907 there is evidence of the eastward trend of the epidemic through Asiatic Russia, for plague was reported to be prevalent in the Transbaikal Province at Nadarovski, in the Akschinsk district, and also at Prjevalsk on the Chinese frontier.

In July of 1908 plague reappeared among the nomad tribes inhabiting the Kirghiz steppes in Astrakhan. In 1909, during June and July, a small but extremely violent outbreak was recorded in the Kirghiz steppes in the Ural government. The Russian Plague Commission also announced officially that several cases of pneumonic plague had occurred in the village of Iltoë, in the district of Ulentin, 140 versts from the town of Uralsk; 22 deaths occurred. This village is obviously in the endemic area described above. Later on in this year, in November and December, the disease broke out in its bubonic and pneumonic forms in a Kirgbiz encampment in the Uralsk province. Fourteen cases occurred, 13 of them proving fatal. This infection spread to adjoining districts.

During 1910 plague was present in the Astrakhan government from January to March in the Kirghiz steppes. The disease was also noted, more eastward, in Turkestan during July and August in the district of Prejreals. In August it occurred in the Uralsk province at Djambertine. In the Kirghiz settlement of Akbalyk the outbreak was reported as pneumonic plague. It was said the attacks only lasted a single day. Out of 189 cases in the Uralsk province there were 179 deaths. In one of the settlements there were 28 cases, all of which were fatal. Another outbreak occurred in the same locality in November. An epidemic, said to be "tarabagan plague," was reported during the summer by a Russian medical man of Akschinsk as having occurred a short distance inside the Mongolian frontier. In October it broke out in North-West Manchuria.

*South China.*—An undoubted seat of endemic plague is the Yunnan province, where for generations past it has been noted as a "soil disease," causing the death of animals such as rats, dogs, and cattle, as well as of men. Epidemics have been medically described in the Reports of the Imperial Chinese Customs since 1871, periodically by Manson and Lowry. From Yunnan plague spread to Pakhoi overland through Kuangsi or the borders of Tonkin. In 1894, after having been for some years previously annually recurring in Nanning-fu and Kwaiun on the West River, plague appeared in Canton, whence it travelled to Hong-Kong. This latter place was also probably infected from Pakhoi, an insanitary pest-spot on the coast at the southern end of the Kuangtung Province, which has continued since that time to have annual epidemics, and is a known endemic port which has been described as being in possession of a continuous plague epidemic constitution. Hong-Kong, which may also be said to have an epidemic constitution, is open to infection through its Chinese suburbs of Wuchow and Pakhoi, which maintain direct communication with the endemic area. Since the Hong-Kong outbreak of 1894 plague has spread to all the coast ports, as also Macao, Formosa, and Hainan Islands, which suffer from sporadic attacks, with the notable exception of Shanghai, which has kept inexplicably free of any human epidemic (i.e., beyond a few cases), although rat plague has been noted for the past few years. For five years the epidemic did not appear north of Amoy, though Shanghai, Chefoo, Tientsin, and Newchwang had been in constant communication with Hong-Kong, Canton, and Swatow during the years plague was epidemic in the southern provinces. In July, 1899, it suddenly appeared in Newchwang, having passed over the intervening ports. The first case noted was that of a youth who was in a shop which had no dealings with steamers, nor had any of the inmates come from the south. He died from bubonic plague. Investigations made

by Dr. Daly show that rats were affected. In a medical report of the epidemic (September, 1899) Dr. Daly stated:—

> In the early part of September many deaths took place in the houses and shops in close proximity to foreign residences, and about the same time it was noticed that rats, chickens, ducks, geese, pigs, dogs, deer, and cattle were dying in unusually large numbers. In one of the dairies four cows and two calves died. By the end of September the plague had reached towns 21 miles south-east, 17 miles north-west, and 40 miles north-east of Newchwang. Five Russians were attacked, three of whom died, but no other foreigner was affected. The symptoms and course of illness of this epidemic were the same as those of the southern coast ports. About 2 or 3 per cent. of the population were attacked, and of these 80 per cent. died. Adult males were attacked in greater proportion than either women and children. Buboes were absent in many cases in which the lungs were affected. Various instances were described of people who had handled dead rats becoming infected.

Considerable apprehension was expressed as to the probability of the epidemic spreading to Tientsin, between which port and Newchwang there is a considerable junk traffic. A systematic junk inspection was strictly carried out. Tientsin escaped entirely.

Since the Newchwang epidemic North China remained plague-free till the outbreak at Tongshan, a mining centre on the railway between Tientsin and Shanhaikuan, in 1908.

An outbreak at Tongshan in 1908 was ascribed by Dr. Moorhead of the Mining and Railway Hospital, Tongshan, to a migration of rats. Writing to me at the time of the outbreak he said:—

> If there is one thing more certain than another it is that an immense migration of rats occurred from the north-east in the late spring of this year and that rats in thousands arrived in Tongshan during April and May. These rats differ from our local rats in colour and other points and have been picked up in the streets 16 to 20 a day dead of plague. In the early part of September they began to migrate from Tongshan.[3]

Dr. Moorhead thought at first that the epidemic was undoubtedly due to these rats, but later on, on considering that the rats were spread over all parts of Tongshan from May to August and that the first case of plague occurred in the Cantonese living in the Cantonese quarter and that numerous Cantonese arrived from Hong-Kong during the summer and that for the first three weeks of the disease only Cantonese were affected and only the Cantonese quarter, he was forced to the conclusion that the disease originated not in the migration of rats, but was due to infection brought by one or more Cantonese from Hong-Kong. When the epidemic spread from the Cantonese to Northern Chinese it spread rapidly. At the beginning bubonic cases greatly outnumbered the other varieties, but intestinal (septicæmic) and pneumonic cases were met with in increasing frequency. About 60 per cent. were bubonic, 35 per cent. pneumonic, and 5 per cent. septicæmic. Death occurred most frequently during the first three days. Some died in six hours and a fair number under 12 hours—i.e., after the first initial symptoms. In the bubonic cases some patients who survived as long as three weeks not uncommonly died, and death at this time was often sudden and without warning. Between 70 and 80 per cent. of the bubonic patients died. The intestinal, pneumonic, and septicæmic cases all proved fatal. The majority of cases were found in young adults, 15–25 years, and in the old after the fiftieth year. Entire households were destroyed, and even farm animals died. Yet, on the other hand, single cases were often met without any other members of the family being affected. The poor suffered much more than the better classes. Villages in all directions, as far as 40 li (13 miles) from Tongshan were infected. No precautions worthy of the name were taken to safeguard Tientsin and Peking (or anywhere else), though these two towns escaped. Families able to leave Tongshan were allowed to do so any time. The first patient died on August 23rd. The next case found was on Sept. 5th, and after that an average of 15 to 20 deaths occurred daily. It had practically ended by December, during which month there were only five cases, and one in January. With regard to rats it was observed that not a single rat of the horde that swarmed in Tongshan during spring and early summer was found from September onward. Of the rats examined during the epidemic 1 per cent. was found infected. Some rats which remained well for days without any sign of glandular enlargement during life were found on being killed to have B. pestis in their spleen blood, evidently immune to infection. Rats trapped in the mines were found to be less readily infected experimentally than those found above ground. The total deaths in the Tongshan epidemic were 800 out of 1000 cases.

[3] Though there is no evidence as to where they came from and if plague was there at the time.

### MONGOLIA.

Accounts of epidemics throughout Mongolia have never been the subject of medical investigation till in 1899 Dr. J. J. Matignon, medical officer to the French Legation at Peking, made a journey north to the valley of So-lu-kou, from which reports had been received stating that plague had been occurring annually during the preceding nine years. This valley lies at the foot of the Mongolian plateau, about 12 days' journey by road north-west of Peking. It is inhabited by Chinese colonists. Here in September, 1888, plague appeared for the first time. The earliest known case was that of a girl who had never been out of her village (Yang-chia-k'ou), and though Dr. Matignon attributed the infection to labourers from Shantung who arrive every spring to work as farm hands, and who he thought had probably brought infection from the south, it is highly improbable that this was the case as plague had not at that time been signalised in any coast port. Missionary information was forthcoming from notes kept during the epidemics in this quarter since 1896. According to them the 1896 epidemic began in the village of Chou-chia-on-p'u and spread over several villages, generally tending towards the north and east. At Tung-chia-ying-tzu, which was the village most affected, 15 per cent. of the population were affected with deaths in every case. There were 170 deaths altogether in the So-lu-k'ou valley. All the cases observed were bubonic up to the middle of September, when the epidemic arrived at the northern summit of the valley, and from now on till November, when the weather had become cold, "tous avaient des crachats pneumoniques."

In 1897 there was a recrudescence but less severe, with a mortality about one-seventh that of the preceding year. During the 1896 epidemic, while it was mainly confined to the So-lu-k'ou valley, in one instance it crossed the mountain of Ma-lien-te and, descending a small valley, attacked the village of Chang-san-ying-tzu. It is therefore interesting to note that it was in this latter village that the first case appeared in July, 1897. It spread towards the north-east, and at the end of August it was noticed that the infection had again been taken over the mountain, for villages in sequence from the north to the south of the valley became affected. This ended in September.

In 1898 the epidemic again appeared in July, and it was noted that it was preceded by a great mortality among the rats, "dont les cadavres sont trouvés en grand nombre dans la campagne ou dans les rues, ici rien de semblable n'est survenu." Many cases of infection from man to man were noted by Dr. Matignon. This epidemic was bubonic, though several cases of secondary plague (pneumonic) were noted. The death-rate was estimated at 99 per cent. One man, a Christian convert, who had had bubonic plague and recovered from it the preceding year, was again attacked in 1898 and died.

### SPREAD OF THE EPIDEMIC THROUGH MANCHURIA, CHIHLI, AND SHANTUNG PROVINCES.

The railway has been the all-important factor, and the appearance of plague in almost every town involved has followed the arrival of one or more passengers from an infected area. Starting from the neighbourhood of Manchuria station the epidemic was first noted as occurring at the beginning of October, 1910, where it spread rapidly among the tarabagan trappers. From Oct. 13th to 26th plague cases were also noted at Dalainor, Cha-lan-tun, Hailar, Buhutu, and other stations which lie at the frontier of the wild uncultivated steppes which reach almost to Tsitsihar. Up to Oct. 26th there is no report of any effective precautionary measures having been taken by the Russian authorities, but about this date General Afanassiev, accompanied by the chief railway medical officer, visited the plague area, where he was joined by Prince Khilkoff, and extraordinary measures were organised to prevent plague entering Russia and to fight the epidemic locally. Twelve medical officers of the railway staff with 25 sanitary men were brought to the area, and thanks to the active measures employed by Monsieur Koksaroff (chief assistant to General Afanassiev) the local epidemic was for the time being subdued. At Harbin the epidemic was taken in hand by a general anti-plague bureau which had summoned Russian plague experts to help it. This bureau supervised the New Town, the

whole railway area and the Pristan, and the Russian authorities offered assistance from it to Fuchiatien, the Chinese town bordering on the railway settlement. China at that time, however, was unfortunate in having as local representative an official who consistently refused to accept Russian medical help or to adopt the proposed preventive measures. His police did nothing and were indifferent, and the people, taking their cue from the prefect, were also indifferent. Under such circumstances Fuchiatien speedily became a hotbed of infection, and the Russian authorities had no other course than to adopt a defensive attitude and to endeavour to make and keep Russian Harbin as free as they could. Plague has no doubt been prevalent in this latter place, but not to anything like the same extent as in Fuchiatien, for whereas up to Feb. 13th there were 912 deaths out of a population of 53,000 (including 30,000 Russians but not counting troops) in Russian Harbin, there were 3795 deaths out of a population in Fuchiatien which nominally stood at about 20,000, but was no doubt actually less, as in January there was a great exodus from Fuchiatien into Harbin of merchants, assistants, and families, also people whose work was in Harbin. Numbers of these people also went to Asiho, Shuang-ch'ing-p'u, and Hu-lan-fu. A Russian estimate gives the death-rate of Fuchiatien as 6 per cent. in December and 25 per cent. in January. In Russian Harbin the estimate for three months gives a death-rate of 2½ per cent. Towards the end of December the Central Government authorities at Peking sent up Dr. Wu Lien-Teh, Dr. Mesny, and other medical assistants. They were joined by Dr. Gibb shortly after and the work of dealing with Fuchiatien was organised. A Chinese Plague Commission was established and the Central Government authorised Dr. Wu to use full powers and whatever funds were required were to be placed at his disposal. Notwithstanding this, the doctors had to encounter local official obstruction which did not cease till the Taotai was dismissed shortly after.

On Dec. 28th, 1910, the epidemic had spread to Changchun (Kuan-cheng-tzu), a town of 125,000 inhabitants; it was traced to a merchant who had come from Harbin and three days later a coolie who had also arrived from Harbin died at Kung-chu-ling. By Jan. 9th, 1911, five plague deaths had been noted in Mukden, from which place three days later 25 deaths were reported, and four days after that (on Jan. 16th) 53 cases had occurred, so that the epidemic had settled down with equal virulence here. At the same time consular reports were received notifying infection at Ssu-ping-chieh, Chang-tu, Kai-yuan, and Tieh-ling, which are all stations on the line between Chang-chun and Mukden. During the first week in January a plague death occurred at the Huang-hsi-lin barrier (Kirin province) and on Jan. 8th two cases were reported from Dairen. On Jan. 10th a man arrived in Peking from Mukden, became sick on the 12th, and died on the 14th. On Jan. 14th a plague-stricken coolie was found in the train at Chin-chow fu station (more than half way on the line between Mukden and Shan-hai-kuan). Hsin-min-tun was also infected. The following day passenger traffic was suspended on the Mukden-Tientsin line, but this measure was too late, for on Jan. 16th a plague death occurred in the Austrian concession, Tientsin. About this time the South Manchurian railway refused to take any passengers south from Kuan-cheng-tzu (Changchun) and as the Chinese Eastern railway still continued to bring them down from Harbin these plague-stricken, infected emigrants became scattered over the roads and by-paths aiming to get at Chihli and Shantung provinces.

By Jan. 20th cases were reported from Yung-ping-fu, a country town miles south-west of Shan-hai-kuan, and from villages north-east and north-west of it.

On Jan. 21st two plague deaths occurred at Chefoo which, according to a consular report, were no doubt imported by steamers from Dairen. Not only was plague thus introduced by sea route into Shantung province but it also came by rail. Over 40,000 coolies had a short time before passed down the Tientsin-Pukow line from the north and carried infection to Te-chow and other points (Tung-kuang, Paoton, and Ping-chia-k'ou) on the railway. Plague-stricken coolies were taken from the train, and in several cases deaths occurred en route. Eventually the epidemic reached Tsi-nan-fu, the provincial capital of Shantung.

On Jan. 24th 11 plague deaths were reported from T'angtsun, a village 10 miles south-west of Paoting-fu on the Pe-han line, so it had thus penetrated into Southern Chihli. During this time it was steadily spreading in Manchuria and many deaths were being recorded from various places throughout Kirin province and apparently in almost all the districts lying along and in close proximity to the railway line. The settlements round the stations are, as a rule, more densely populated and were worse infected than the outlying more sparsely populated villages. In addition to the spread southwards, reports arrived showing that towns to the north-east and north of Harbin were also badly infected, many deaths being recorded from Hu-lan-fu, Asiho, Shuang-ch'eng-p'u, Khandao-hei-tzu, Kirin, San-hsing, Tsi-tsi-har, and T'ai-ching-shan.

On the western side of the railway, outside the great wall, cases spread to the neighbourhood of Chao-yang-fu, Hsi-tao-ling, and Kou-chan-tzu.

By Feb. 7th cases were reported from Ta-chih-pu, one of a string of villages on the Hai-ho river and bordering on the Belgian Concession at Tientsin. The epidemic had also spread further down into Chihli as cases occurred at Li Hsien, 20 miles south-east of Paoting-fu, and at Ho-chien-fu, 50 miles south-east of Paoting-fu, whence it spread across to Tingchou on the Peking-Hankow line.

On Feb. 14th the Japanese Consulate, Kirin, reported that the epidemic had reached Hun-chun and Yan-si-fu on the Korean border.

The important ports of Newchwang and Ching-wan-tao have altogether escaped.

## MANAGEMENT OF THE EPIDEMIC IN VARIOUS IMPORTANT CENTRES.

*Harbin (Fuchiatien).*—Reference has already been made to the way in which the epidemic was allowed to take hold of this town. When Dr. Wu and Dr. Gibb took over the work and had finally surmounted the local official obstruction they adopted the following preventive measures. 1. A military cordon drawn round the town to prevent the ingress and egress of carts and passengers. 2. The division of the town into four districts, each under the supervision of a superintending medical officer with several assistants and provided with bodies of police to collect the sick, bury the dead, patrol the streets, and keep a watch on open spaces. Further, a prohibition against the inhabitants of the different districts passing from one to the other. 3. The provision of a central plague hospital and isolation hospital and of branch establishments in each of the four districts. 4. Military cordons across large and small roads outside the town and giving access thereto, and bodies of police to keep a close observation, and at once to notify to the Plague Bureau the presence of sick persons and dead bodies. 5. The substitution, in view of the extreme cold and the frozen state of the ground, of cremation for ordinary burial. The execution of these measures left something to be desired at first owing to a lack of discipline among some Chinese members of the subordinate staff, and in particular among the Lu Chün troops sent from Changchun. The regiment was plague-infected before arrival, and about 50 deaths occurred in it, while numbers of the men had to be quarantined. But in the face of most rigorous climatic difficulties the Chinese Plague Commission here did very well. China was fortunate in the possession of an energetic chief medical officer, Dr. Wu Lien-Teh, whose efforts were ably seconded by Dr. Gibb, Dr. Aspland, and Dr. Stenhouse. Over 3000 corpses were burned, and by the end of January the work was efficiently carried out, and that it was effective is amply borne out by the figures. The British medical men have expressed themselves as quite satisfied, and as criticism has been found necessary in parts of this report, it is only fair to add that in Fuchiatien, the most virulently affected town in the whole course of the epidemic, the officials (Chinese and foreign) showed considerable courage and ability in surmounting difficulties, and were able to work in a spirit of friendly coöperation.

*Changchun.*—This, the first big city south of Harbin, is at the junction of the Chinese Eastern and South Manchurian Railways. It is a very crowded and insanitary town and has no wall, so that it was impossible without a large force to prevent people from leaving by stealth if they were determined to do so. The outbreak first occurred in the inns on the main road between the station and the city. In the latter the first cases were noted in various large shops. To limit the spread southward the South Manchurian Railway stopped taking third-class passengers, which resulted in

large numbers of coolies being detained here. Effective measures were not taken till the epidemic had become well settled down and the officials were powerless to cope with the Chinese Eastern Railway trainloads arriving from Harbin. Concealment of death was rife and local foreign medical efforts were powerless. In the course of January the local officials were supplanted by the Taotais Meng and Huang (the latter a foreign-trained medical man), who forthwith began energetic measures and coöperated with the British and Japanese medical men. Seven contact isolation camps were established in inns which were adapted to their use. A medical report stated :—

> The main difficulty is in getting the whole scheme, which is well conceived, carried out effectively. It has to be entrusted to men who know very little of the reasons for the various steps and are careless about details. At the same time the Plague Prevention Bureau is doing well with the *personnel* available.

The methods pursued were as follows. Each street was taken in turn, the people were removed, sulphur was burnt in their houses, they were sprayed with disinfectant, and lime was strewn on the streets. A fire engine was purchased as well as a large quantity of disinfectant and the roads were sprayed once a week in turn. Attention was also paid to the villages for a radius of six miles (20 li) from the city. Many were found dead on the roads who were, no doubt, people escaping from the city. On the cessation of Chinese passenger traffic between Harbin and Changchun the state of affairs began to show a gradual improvement. Although for some time the death-rate figures showed an increase, this was found to be due to improved methods of investigation and house-to-house visitation, but soon a steady diminution was noticed in the area subjected to anti-plague measures. The energetic measures taken by the Taotais were supported by the gentry, but there was much obstruction from merchants "in the interests of trade." A cordon was drawn round the city, and latterly plague corpses were burned. Taken all round, the epidemic management of Changchun has been well done. In the railway zone a quarantine station was established in the middle of January, and strict medical inspection of selected passengers was carried out by Japanese medical men.

*Mukden.*—On Jan. 9th the occurrence of several plague cases, along with the news of deaths from a similar cause at Changchun and Kungchuling, showed the authorities that the epidemic had arrived in their town. A sanitary board was formed and the services of the resident missionary medical men were engaged to supervise arrangements. Isolation hospitals and contact stations were established, and the police were instructed to carry out a house-to-house visitation. The authorities were doubtless severely handicapped by the lack of a sufficient number of medical men and the absence of any trained staff of workers; further, the well-known dislike of the Chinese people to sanitary measures and the suspicions with which they regard any innovation placed obstacles in the way of the police in their efforts to carry out their instructions. However, Dr. Christie reported that his suggestions were met in every way possible and that the higher officials, notably Mr. Chang, the Commissioner of the Interior, and Mr. Han, of the Foreign Board, were fully alive to the danger, and did their utmost to assist the Sanitary Board. A noticeable feature at Mukden, thus differing from Changchun, was that the merchants voluntarily offered a monthly subscription of Tls. 10,000 for epidemic expenses. Five days after it became known that plague had settled on the city the authorities were nonplussed by the return of a train containing 400 coolies who had been sent south to Shanhaikuan, but among whom *en route* three deaths occurred, causing the train to be sent back. No suitable buildings were available and the men were put into various inns near the station under police escort. Dr. Jackson at once volunteered to take over the general supervision under circumstances of great difficulty due to lack of organisation, and, at that time, indifference to sanitary measures. Seventy of these men succumbed, and there were also many other deaths in this part of the railway area. It was in the hard work entailed in dealing with these coolies Dr. Jackson became infected and died. A consular report from Mr. R. Willis, in noting the virulence of the epidemic and the difficulties of plague administration, said :

> In winter for the sake of warmth the lower classes sleep huddled together on the kangs packed like sardines and one infected person is almost sure to convey the germs to his companions. Dr. Christie reported to me one case where the only survivor of a family of ten was a little girl. The unfortunate householder had been ill advised enough to offer hospitality to a friend from Harbin. Further, the great difficulty for the officials is to find adequate shelter and warmth for contacts; the people, who, after all, are generally fatalists, say they would sooner die of plague than of cold, and in the combined fear of being taken to isolation hospitals and of seeing their homes burnt, undoubtedly strive to conceal cases from the officials. The most approved method is to drive the sick man into the streets with instructions to get as far as possible from his home before dying.

That the segregation measures were effective to a considerable extent is indicated by the analysis of cases during January. Mukden was divided into seven sections, and there were 375 deaths that month, of which no fewer than 270 took place in the Seventh Police Section, and 58 more in the Fifth Section. The Seventh Section is the district between the outside western wall and the Chinese railway station, and the comparatively great mortality here was among the coolies who had come from the north, and living in close contact. The Fifth Section is the western suburb, which immediately adjoins the Seventh District. In the city proper during that period there were only six deaths. In addition to the above total there were 74 fresh cases not recorded among the deaths. The epidemic occurred under rigorous climatic conditions in Manchuria which rendered the work of erecting isolation hospitals and segregation quarters very difficult. To quote again from Mr. Willis's report :—

> On the 26th January orders were given to construct an isolation hospital on the open plain to the north-west of the city. On the afternoon of the 29th I found that the foundations had been laid, a matter of some difficulty in ground frozen to a depth of at least four feet, and that considerable headway had been made with the structure, a wooden building on the approved plan for modern hospitals. About 200 carpenters and coolies were working with energy and willingness in a temperature of at least ten degrees of frost and a bitter north wind. On the evening of the 29th snow fell to a depth of about 18 inches and access to the building was temporarily cut off.

The Japanese authorities removed the administrative centre of their Anti-plague Bureau during the latter part of January from Dairen to Mukden, and were reported as working in harmony with the Chinese authorities. The Viceroy Hsi Liang also engaged five Japanese medical practitioners to join in the work. The Sanitary Board has throughout the epidemic been guided by Dr. Christie and Dr. Young.

*Tientsin.*—The incidence of plague in the commercial capital has been very small. With the exception of the Austrian concession, in which seven deaths occurred, all the other foreign concessions escaped and the epidemic, slight as it was, was confined to the native city where, so far, the total number of deaths has been not more than 63. A sanitary department was organised which enforced compulsory notification of deaths, medical inspection, and sale of coffins only on licence from the department, which inquired into each individual case and on the whole was satisfactorily active in the isolation of plague cases and segregation of contacts. Inoculation was freely offered but was little taken advantage of, and various indications were given the officials that the people would resent any forceful measures in this direction. As in the case of Peking, the comparative freedom of Tientsin from a medical point of view is remarkable, as in the middle of January vast hordes of coolies passed through it from Manchuria *en route* to Shantung.

Escape seemed to the medical officers of the foreign settlements so unlikely that they proposed various active measures, and at a meeting of the Tientsin Chamber it was resolved that if further evidence of infection occurred a military cordon should be instituted round the foreign concessions. As there was not in any way a sufficient number of police, such a measure was impracticable without calling in the services of foreign troops. A military cordon would have involved the right of the guards to fire upon foreigners and Chinese in the event of defiance of its restrictions, and in addition to the numerous and insuperable international questions it would have raised, evidence was not wanting that the Chinese would have bitterly resented such a step. Mass meetings of influential Chinese were held in the city at which proposals were made to call every Chinese out of the concessions in case of a cordon, and not permit them to return, and it was claimed that its institution would have entailed immense loss to the mercantile community and probable cutting off of food supplies.

The extent of the concessions at Tientsin is very large. On the south side of the river are the Japanese, French, British, and German concessions in the order named, beginning at the Chinese city to the north. These stretch for

three miles from north to south, and one mile from east to west, in the broadest part. The Chinese population therein is considerable; at least 10,000 in the Japanese portion and several thousand in the French and in the British and German concessions. On the other side of the river there are the Austrian, Italian, Russian, and Belgian concessions, stretching for 3½ miles from north to south, and a mile broad in parts. The Chinese population in these is large—over 40,000 in the Austrian, 18,000 in the Italian, and several thousands in the Russian and Belgian concessions. To cope with even the French, British, and German Settlements would have required at least 1000 men to form a cordon. The Consular Body, therefore, withheld their consent till plague conditions would have rendered such a step absolutely necessary. Nevertheless the agitation for a cordon was not without its good effects, as it convinced the Chinese authorities of the necessity of taking more stringent measures as regards traffic from Manchuria and of actively instituting preventive and segregative steps locally.

*Peking*.—The Sanitary Department of the Mincheng-pu (the Board of Home Affairs) has throughout kept track of such cases as did occur, and no death can at present take place in the city without being shortly after visited by one of the department's medical officers. A list has been published each day giving the names and addresses and causes of death in every case. Isolation and quarantine hospitals have been erected. Inoculation has been freely offered gratis, but the people have taken very little advantage of it owing to various rumours. Having regard to the large number of people in the Quartier Diplomatique, including the soldiers of the various Legation Guards, measures were taken to draw up a system of quarantine which would have been ready for enforcement should the epidemic become severe in the city. All the available graduates of the Peking Union Medical College were engaged by the Mincheng-pu to join the sanitary staff, and did much good work, especially in the microscopical diagnosis of true or suspected cases.

*Tsitsihar*.—The epidemic here, sown by passing coolies, is reported to have died down in December and recurred during the latter half of January. The sanitary measures taken were insufficient. The second outbreak occurred among the Chinese troops stationed at Tsitsihar. "The want of understanding how to prevent the spread of the disease is shown by the fact that after the removal of the soldiers affected by plague from the barracks the latter were not disinfected, and the recruits arriving in town were placed in the same buildings, with the consequence that 13 of them also fell ill." Not all the corpses were burned, many of the coffins being simply thrown on the fields. There were over 1000 deaths here, and the general management of the epidemic suffered much from the lack of medical assistance. When the epidemic was at its worst the authorities frequently burned infected houses together with the corpses inside.

*Kirin*.—The epidemic gradually but steadily forced its way southward through this province among the districts lying along and in close proximity to the railway line, the majority of the districts scattered outside the railway zone escaping free. In Kirin city plague arrived on Jan. 12th and increased in intensity till there were over 20 deaths daily. Both the Russian and Japanese Consuls reported favourably of the efforts at suppression made here. "The Chinese authorities are doing splendidly, and the medical advisers to the head office of the sanitary bureau, Drs. Ishibashi and Greig, are taking every opportunity of advising the authorities." The entrance of carts bringing goods into the walled city was prohibited, with the result that the price of foodstuffs rose 30 per cent. and fuel 65 per cent. Nu-ma-hun, where the majority of the resident Japanese live, was the centre of the outbreak. Regulations were issued by the Japanese Consul in this quarter prohibiting every kind of business which attracted crowds, such as restaurants.

*Shantung Province*.—Though the authorities in Shantung are well aware that large numbers of labourers annually return during the winter months from Manchuria to await the spring before going back to their work, the spread of the epidemic did not suggest to them the urgent necessity of quarantining these labourers so as to avoid its importation into Shantung. Chefoo, the natural landing place, was invaded before precautions were taken, and the epidemic soon spread across the Laichow Peninsula and threatened Tsingtao. The German authorities were, however, alive to the danger, and on Jan. 27th they drew a naval and military cordon round the German Colony, and all ingress was cut off except subject to quarantine. This also included all steamers from the north. The Tientsin Railway to Tsinan was not closed soon enough, and an outbreak was reported from Te-chow, the first large town in Shantung on the Tientsin-Pukow line. In the meantime plague from Chefoo had spread to the railway zone of the Kiaochow-Tsinan line, and traffic here was also stopped about the beginning of February.

On Jan. 25th the Consuls and foreign medical men requested the Governor to extend a military cordon along the north bank of the Yellow River to prevent all crossing except at definite quarantine stations. Though this was agreed to, a certain amount of lax discipline nullified the benefits, and not long after plague appeared in the camp of the Fifth Division and in the city of Tsinanfu. There is no evidence that segregation was strictly carried out so as to avoid infection; the German Consul and merchants had a military cordon placed round that part of the international settlement in which they resided. The diffuse spread of plague throughout the province testifies to the liberty of peregrination allowed the returning wanderers. The Governor, however, acting in conjunction with the authorities of Chihli and Honan, has forbidden the annual spring pilgrimage to the sacred mountain of T'ai shan, for which several thousands of pilgrims had already collected; access to the mountain and its temples has been shut off. The greatest mortality from the epidemic has been in the north-east of the province.

I append an instance of the spread at Changchun, where the initial stages were traced (the various links in the chain are worth reproduction).

*Changchun*.—On Dec. 28th a man named Chang (*a*) of the (1) Fu-hsing-jen shop arrived from Harbin and died in the shop, infecting its inmates. A nephew of this man, also named Chang, (*b*) visited his uncle and carried back infection with him to the shop where he was employed, the (2) Fu-hsing-chen shop. Another nephew of Chang, (*a*) named Liu, (*c*) visited his uncle and died after infecting another shop, (3) Chang-sheng-ho shop. Another man named Chang (*d*) visited Liu (*c*) and died, infecting (4) Shun-sheng-tang shop. Still another Chang (*e*) visited Liu (*c*) and died, infecting (5) Yung-sheng-ch'ing shop. Yet another Chang (*f*) visited Chang (*e*) and died, infecting (6) Wan-neng-ch'ing shop.

All the above were infected, and deaths occurred before any deaths from plague in the city had come to public notice. Shop (2) lost 6 men; shop (4) lost 12; shop (5) lost 14; shop (6) lost 8. Though, doubtless, there were other cases it is interesting to note from the above that a distinct train of infection was laid by the mercantile class apart from the returning coolie class, to whom the spread of infection is mainly attributed.

### ANTI-PLAGUE BUREAU OF THE CHIEF SANITARY-EXECUTIVE COMMITTEE.

*An Outline of the Anti-Plague Measures in Harbin.* (*From the Beginning of the Epidemic up to Jan. 25th, 1911.*)

In order to ensure uniformity in the work of the various organisations engaged in combating the plague in Harbin an Anti-Plague Bureau was established in accordance with a resolution of the Chief Sanitary-Executive Committee.

*Observation, isolation, and plague hospitals*.—These hospitals have been concentrated in one place, at the fourth verst, in barracks, and in heated cars. There are ill-heated cars fitted for quarantine purposes to accommodate 3000 people. The cars are placed on two specially built sidings. For observation purposes there are besides 6 barracks with accommodation for 1500 people and a bath-house. For isolation and plague hospitals there are 2 barracks with 3 divisions for 100. An isolation hospital fitted with 54 beds and a separate plague hospital with 43 beds have also been provided. At the Moscow Plague Point (i.e., the fourth verst) there are: 3 medical practitioners, 2 medical students, 13 assistant medical men, 5 Sisters of Mercy, 1 apothecary, 90 "sanitaries," and 30 other employees, making a total of 144. The hospitals are fitted with beds, tables, and stools, and furnished with the necessary linen for the patients as well as for the medical staff. A special lodging-house is also provided for the subordinate staff as well as a laboratory for bacteriological work and a room for post-mortem examination. A special Disinfecting Division, supplied with all the

necessary materials and instruments, is also working there. All those under observation have their temperature taken daily, and if after five days no case of sickness has occurred amongst them they are released after having taken a bath and had their effects and clothes disinfected. For the steam disinfection of effects and clothes two cars have been fitted in which the temperature is raised to 100° C., and 2 "Helios" apparatus have also been ordered. In the observation hospital kitchens have been arranged for feeding those under observation, and plague patients as well as the subordinate staff and employees. For burying the dead, including bodies picked up by the Emergency Division, a squad of grave-diggers, provided with special carts and instruments, has been organised. The plague cemetery is situated about two versts from the hospitals.

*The Emergency Division.*—The quarters of the Emergency Division for transporting the sick and bodies found are situated in the centre of the town. The division consists of 1 medical practitioner, 1 medical student, 4 assistant medical men, 27 "sanitaries," 9 drivers, and 10 other employees. The division has 3 ambulances for transporting the sick, 4 platform carts for conveying the dead, and other necessary vehicles. In addition to the hired *izvostchiks* for transporting the medical staff, the division has 13 horses with all the necessary means of transportation. In the house of this division a laundry plant has been erected for washing the clothes and effects of the staff, and a bath has also been provided.

*The Disinfecting Division.*—This division consists of 2 medical practitioners, 3 medical students, 10 assistant medical men, and 49 "sanitaries." The division has 18 carts for transporting the disinfecting apparatus, hot water, fire-pumps, as well as the articles to be disinfected. There are 25 horses. The disinfection of articles is done in a specially fitted car and by means of the "Helios" apparatus. The division has also 20 hydropults of different systems and a supply of the necessary disinfectants as, for instance, carbolic acid, chloride of lime, sublimate, green soap, &c. The division has its headquarters in the buildings of the so-called Town Hospital for Prostitutes. The division also has a laundry plant and a bath-house.

*Medical-Sanitary Districts.*—The town is divided into nine medical-sanitary districts the staff of which consists of 12 medical practitioners, 4 medical students, 16 assistant medical men, and 23 "sanitaries" and interpreters. The district committees daily examine the inhabitants. Suspicious cases and those persons who have been in contact with plague patients are sent to the observation-isolation hospitals. For the staff of the district committee quarters have been provided in the centre of the town at the same place where the Emergency Division is stationed.

*Searching Division.*—For detecting suspicious cases among the Chinese population and for special search work in the streets inhabited by the Chinese, a special Searching Division has been organised under the supervision of a medical man, who speaks Chinese, as well as two European and four Chinese interpreters.

*The destruction of inhabited shanties infected with the plague.*—Several Chinese shanties, which it is impossible to disinfect, in which there have been cases of plague, have been destroyed in such a way as to render them uninhabitable after disinfection—that is to say, roof, windows, and doors are all removed. This work of destruction has been performed by the three divisions composed of employees of the Fire Department. All the population from the streets in the Pristan chiefly infected with plague have been removed to the observation hospitals; all houses, lodging-houses, restaurants, and opium dens have been thoroughly disinfected, several places have been closed entirely; while others have been examined by a special medical-technical committee with a view to deciding on the necessary repairs or their total destruction. All the houses in town where there have been cases of plague have been thoroughly disinfected under the supervision of doctors and students.

*Lodging houses.*—For lodging the poor Chinese population, who were left after the destruction of the shanties without quarters, a lodging-house has been provided to take 300 persons and heated railway cars have been furnished to accommodate 500 more. These lodging places are under the direct care of assistant medical men and under the general supervision of a medical practitioner, and the inmates have their temperature taken daily.

*Bath houses* have also been arranged for the poor Chinese population.

*Laundries.*—All Chinese laundries have been put under the strict supervision of the district medical officer and in a few days it is intended to organise a special laundry under the control of the Bureau. Of the seven laundries in Madiagou, in which work has been done for Europeans, two have been closed entirely and the linen all disinfected, while the rest have been put under strict sanitary supervision.

*Supervision of water-carriers.*—Instructions have been given to the Chief of Police to register within four days all the water-carriers, who will be accommodated in groups in special quarters leased for them and will be supplied with special bracelets and certificates; a special sanitary supervision over them will also be established.

*Supervision of industrial and manufacturing enterprises.*—Trading and industrial enterprises, factories, mills, &c., are obliged in accordance with a special regulation issued by the Anti-Plague Bureau to hold their own medical supervision of all their employees and labourers in addition to the general supervision maintained by the district medical officer. The special attention of the sanitary committees has been called to bathing houses, hotels, bakeries, butchers, and lodging-houses.

*Bacteriological examinations* are conducted by two medical men in a special laboratory situated in the central hospital.

*Inoculations* are made free of charge daily in the Town Dispensary (Diagonalnia Ulitza) in the Pristan, in the Municipal Council (for municipal employees), in the Railway Administration Building (for railway employees), and in the Branch of the Military Hospital (Tsisikarskaia and Potchtovaia Ulitza) in the New Town and in the Old Town. In a few days it is intended to open new places in the Mechanical Shop District and in the Birzevaia Ulitza in the Pristan, and at other places in the New Town.

*Sanitary guardians.*—In each of the medical districts (9) sanitary guardians have been appointed. The total number of guardians (Russian and Chinese) number at present about 100.

*Insurance, inoculation, and other means for protecting the staff engaged in fighting the plague.*—The personal staff of all the organisations engaged in combating the plague is insured in case of death in the "Rossia" and "St. Peterasburg" Companies. In guarding against infection the staff is supplied with tarpaulin or linen coats, gloves, rubbers or tarpaulin socks, and are also obliged, when picking up the sick or dead bodies, to wear respirators. All the staff are compelled to be inoculated.

*Surrounding.*—With a view to preventing the entry into the town from Fuchiatien and other neighbouring Chinese villages of Chinese infected with plague, the town territory has been surrounded by police pickets over a distance of 15 versts. Admission is only allowed through five medical observation points, at which the temperatures of suspicious cases are taken. 100 foot and 50 mounted police have been placed on this duty. The medical staff consists of 10 assistant medical men and one medical student.

*The staff of the different organisations and the expenditure incurred.*—The staff of the different anti-plague organisations working in Harbin consists of 22 medical practitioners, 11 medical students, 54 assistant medical men, 194 "sanitaries," 5 sisters of mercy, 1 apothecary, 3 persons in charge of effects, and 69 drivers, cooks, messengers, &c.; making, together with the members of the Anti-Plague Bureau and its bookkeepers, &c., a total of 375. The total expenses since the outbreak of the plague up to Jan. 20th amount to about 125,000 roubles.

*Measures taken by the Governor-General of the Amur province to prevent invasion of the epidemic into Russian territory.*—1. The entrance of Chinese workmen into the Amur province is prohibited. 2. The entrance to Russian territory by sea is also prohibited to all Chinese, except first-class passengers, coming from plague-stricken districts. 3. All Chinese merchants entering Russian territory must remain for five days in observation at special sanitary posts established at the following localities: Pottavka, Pogranichnaya, Chachun, Chaisin, Pavlo-Fedorouskoie, and Sheremetievskoie. These regulations were duly brought to the notice of the Chinese Government.

### CHINESE EASTERN RAILWAY REGULATIONS AGAINST SPREAD OF PLAGUE EAST AND WEST.

To prevent the spread of the epidemic Chinese labourers are forbidden to enter Primorsk and Zubaikal provinces; merchants and officials are allowed to pass after five days' quarantine and the disinfection of their effects at the stations of Pogranichnaya (for Primorsk) and Manchuria (for Zubaikal). Tickets are sold to Chinese labourers at the station of I-mien-p'o only. Passengers arriving at the station of Pogranichnaya in the goods-passenger trains change there and get into the trains of the Ussuriski line.

For (1) Chinese going through Manchuria in the expresses, (2) Chinese in the service of the Imperial Maritime Customs, and (3) for Chinese officials of Railway Bureaux, passes are issued at the station of Manchuria by the President of the Sanitary Executive Subcommission. In Harbin the passes are given them by the department which deals with the Chinese authorities. (4) High Chinese officials are allowed to travel in the mail trains and over all the line as an exception, but require on each journey to have a certificate containing their photograph. The certificates given under (3) and (4) are only for one journey and the return. All Chinese passengers, without any exception as to the class in which they are travelling, and whether they have a certificate or not, are medically inspected. Chinese are only allowed to enter Zubaikal province at Manchuria station after five days' quarantine. Chinese going by the Chinese Eastern Railway are permitted to travel only in goods-passenger trains, and are subject to the following regulations:—(*a*) Between the stations of Manchuria and Hurhwra, Yang-tun-tun, Duitsinshan, and Erh-hsien-tien-tzu and Mulin they can travel without interference. (*b*) Chinese, eastward bound or westward bound, travelling to Tsitsihar, remain there for five days' quarantine. (*c*) At the station of Erh-shih-ho, and the platforms of Ch'en, Old Harbin, and Drovianoi Chinese are not accepted on the trains. (*d*) Third- and fourth-class tickets are not sold, and Chinese labourers are not accepted from any of the stations of the southern line nor from Harbin. The sale of first- and second-class tickets from the stations of the southern line to Harbin on No. 5 and No. 6 trains, and second-class tickets from Harbin station on the goods-passenger trains of the main line are sold to merchants and to better-class Chinese in general, but not to labourers or to Chinese who are badly dressed. At Harbin station first- and second-class tickets are only sold to Chinese after medical inspection proves them to be in good health at the time. The medical inspection is held in the fourth-class waiting-room and opens two hours before the train leaves. (*e*) On the section between Mulin and Pogranichnaya, Chinese labourers are only accepted on the westward bound trains—i.e., from Pogranichnaya to Mulin; they are not accepted from Mulin to Pogranichnaya. Exception is made in the case of those who belong to the railway, to whom passes are given with medical permission. (*f*) In all cases Chinese passengers are separated from Europeans and have special cars allotted to them which must not have any connexion with the other cars of the train. (*g*) Chinese labourers are not allowed into the Primorsk province. (*h*) Chinese merchants are allowed into the Primorsk province, but have to undergo five days' quarantine at Pogranichnaya. They must show their passes *visé* by the Consul; and they are then allowed to buy tickets subject to undergoing quarantine. The passports of the Chinese are *visé* by the Russian Consuls at Hailar, Tsitsihar, Harbin, I-mien-P'o, and Kirin. (*i*) Tickets are sold at the stations of the Ussuri railway to Chinese labourers, who are notified that they will only be able to come back into the Primorsk province when plague has disappeared.

After the Chinese New Year, as a lot of labourers were expected at the timber concessions at the stations of Hsi-t'o-o-tzu, Yabolonya, and Vei-sha-ho from Asiho, to the number of 3000 and 1000 carts, to prevent the epidemic getting a hold on these concessions, where there were already 8000 Chinese labourers and 3000 carts, it was decided that all those going to the above-mentioned stations would be quarantined in I-mien-p'o, and that quarantine would also be organised for the carts in the local inns. Soldiers were stationed on the bridges of the Mei Ho.

Parcels for the post are accepted only with a certificate that they have been disinfected.

Tarabagan skins, bedding, rags, Chinese boot-soles, which are made out of rags, linen, and clothes, when exported through Manchuria, must be disinfected. All the stations and the countryside platforms are supplied with disinfectants. The Russian population has been given full instructions with regard to plague and preventive measures by pamphlets and placards, which have been published by Dr. Hurararborschevsky. Bacteriological examinations can be made at all the big stations by the appointed doctors (Harbin, Manchuria). At these examination places there is a system of tickets numbering up to 650, and each ticket has sub-numbers for the contacts.

Plague is not now further west than Duitsinshan, where all measures are being taken to prevent its spread west.

The first plague case in Harbin occurred on Nov. 9th.

### COOLIE TRAFFIC. SPRING, 1910.

The following is a record of the coolies transported by the Imperial railways of North China to Manchuria from southern stations. It will be noted that over 10,000 less returned south than those who went north.

| Period. | From Tientsin to— | | From Chunlian-chung to— | | From Tongku to— | |
|---|---|---|---|---|---|---|
| | Ying-kow. | Muk-den. | Ying-kow. | Muk-den. | Ying-kow. | Muk-den. |
| March 10th ... | 1210 | 25,500 | 4000 | 1677 | 380 | 1911 |
| ,, 20th ... | 1368 | 21,471 | 2724 | 2002 | 684 | 4292 |
| ,, 31st ... | 521 | 13,600 | 541 | 1746 | 372 | 1922 |
| April 10th ... | 321 | 6,466 | 69 | 244 | 254 | 779 |
| ,, 20th ... | 94 | 1,505 | 11 | 18 | 23 | 624 |
| Total ... | 3514 | 68,542 | 7345 | 5687 | 1713 | 9528 |

Grand Total ... ... ... ... 96,329.

The return traffic in the winter of 1910–1911 was as follows:—

| Period. | From— | | | |
|---|---|---|---|---|
| | Mukden. | Hsinminfu. | Yingkow. | Tien-chuangtai. |
| Nov. 10th ... ... | 8,136 | 1137 | 1,134 | 119 |
| ,, 20th ... ... | 8,373 | 1342 | 2,223 | 462 |
| ,, 30th ... ... | 8,641 | 1522 | 5,239 | 1589 |
| Dec. 10th ... ... | 8,116 | 1561 | 2,815 | 418 |
| ,, 20th ... ... | 10,344 | 1607 | 762 | 99 |
| ,, 31st ... ... | 10,455 | 1564 | 398 | 45 |
| Jan. 10th ... ... | 5,494 | 935 | — | — |
| ,, 20th ... ... | 1,343 | 170 | — | — |
| Total ... ... | 60,902 | 9838 | 12,571 | 2732 |

Grand total ... ... ... ... 86,043

### MORTALITY LIST.

The following table has been compiled from consular, medical, and other trustworthy reports forwarded to me throughout the epidemic. From time to time exaggerated accounts were received which were put aside for verification and correction. Whatever errors there may be (due to lack of any uniform system of notification in the various towns and villages) are on the side of under-estimation. The figures concerning Manchuria are approximately correct. They were kindly furnished by the Japanese Legation, which received daily telegraphic reports from the Kuantung Government-General and were corroborated by reports from the Russian Legation translated by Mr. R. Barbier.

*Hei-Lung-Chiang Province.*

(× = Number unknown).

| | Jan. 31st. | Feb 28th. |
|---|---|---|
| Manchuria | × | 300 |
| Dalainor | × | × |
| Khailar | × | × |
| Chalandun | × | × |
| Tsitsihar | 289 | 1546 (F. 9) |
| Sui-hua-fu | 1500 | × |
| Harbin | 1133 | 2709 |
| Fuchiatien | 4671 | 6243 (F. 9) |
| Petuna | 60 | 60 |
| Asiho | 400 | 1296 (F. 16) |
| Sansin | × | × |
| Pinchou | 223 | 662 (F. 13) |
| Yi-lan-fu | × | 80 (F. 13) |
| Kirin | 290 | 322 (F. 23) |
| Pin-chiang-t'ing | × | 4975 (F. 13) |
| I-tung-chou | × | 82 (F. 13) |

| | Jan. 31st. | Feb. 28th. |
|---|---|---|
| Hulan | 500 | 3800 |
| Hailun | 6 | 1448 |
| Pa-yen-su | 20 | 20 |
| | | 8614 |
| Yü-shu | × | 239 (F. 13) |
| A-ch'eng-hsien | × | 496 (F. 13) |
| Jand-si-fu | × | × |
| Hun-chun (Korean frontier) | × | × |
| Shuang-ch'eng-p'u | × | 4960 (F. 14) |
| Chang-chun-fu | 537 | 2923 |
| Huai-te-hsien | 21 | 212 (F. 13) |
| | | 25232 |

*Feng-t'ien Province.*

| | | |
|---|---|---|
| Kung-chu-ling | 1 | 101 |
| Mai-mai-k'ai | × | 19 |
| Shih-p'ing-kai | × | × |
| Ning-an-fu | × | 9 (F. 13) |
| Chang-tu-fu | 56 | 212 |
| K'ai-yüan | 15 | 75 (F. 14) |
| Tun-hua-hsien | × | 9 (F. 13) |
| Ssu-p'an-chieh | 2* | × |
| Fang-cheng-hsien | × | 13 (F. 13) |
| Feng-hua-hsien | 6 | × |
| Ning-an-hsien | × | 11 (F. 4) |

| | | |
|---|---|---|
| Lui-chung | 23 | 67 (F. 12) |
| Shuang-yang-hsien | × | 39 (F. 13) |
| Wu-chang-fu | × | 30 (F. 13) |
| Yen-chi-fu | × | 14 (F. 13) |
| Fakumen | 2 | 131 |
| Tiehling | 3 | 83 |
| Mukden | 496 | 2973 |
| Tushun | × | 141 |
| Pen-hsi-hu | 1 | 17 (F. 6) |
| | | 3950 |

* F.10.

*Mukden—Port Arthur.*

| | | |
|---|---|---|
| Hiao-yang | × | 33 |
| Newchwang | × | × |
| Dairen | 37 | 41 (F. 12) |
| Port Arthur | × | 2 |
| | | 76 |

*Mukden—Tientsin—Peking.*

| | | |
|---|---|---|
| Sin-min-fu | 56 | 1364 |
| Kwang-ming hsien | 9 | 66 (F. 12) |
| I-chou | × | × |
| Kou-pang-tze | × | × |
| Chinchou-fu | × | 27 |
| Ning-yuan-chow | 4 | × |
| Shan-hai-kuan | × | × |
| Yung-ping-fu | 47 | × |
| Tangshan | × | × |
| Ch'ang-Li | 1 | 106 (F. 7) |
| Tientsin | 2 | 65 |
| T'ung-chou | × | 8 |
| Peking | × | 16 |
| | | 1693 |

*Northern Chihli.*

| | | |
|---|---|---|
| Cheng-te (Jehol) | × | 42 (F. 9) |
| Chao-yang-fu | × | × |
| Ta'i-tao-ling (30 l.f.a.) | × | 13 (F. 10) |
| Mang-niu-ying-tze | × | × |
| Erh-chou-Chin-tze | × | 2 (F. 10) |
| Yu-pei-ying-tze | × | × |
| Kou-chan-tze | × | 17 (F. 10) |
| | | 74 |

*Peking—Hankow (Chihli portion).*

| | | |
|---|---|---|
| Paoting-fu | × | × |
| Lu-k'ou-ch'iao | × | × |
| So-yeh-hsien | × | 50 |
| Tu-lu-k'ou | × | 10 |
| T'ang-ts'un | 30 | × |
| Fu-chuang-a | 10 | × |
| Tingchow | × | 2 |
| Li-ts'un-chuang | × | 5 |
| Hsi-chai-li-ts'un | × | 33 |
| Hsia-hsin-chuang | × | 3 |
| Ho-chien-fu | × | × |
| Erh-shih-li-p'u | × | 30 (F. 15) |
| | | 173 |

*Tientsin—Puk'ou Line (Chihli and Shantung).*

| | | |
|---|---|---|
| Tung-kwang-hsien | × | × |
| Teh-chow | × | 64 (F. 18) |
| Tsinan-fu | × | × |
| Chang-kiu (E. of a.) | × | 400 (F. 18) |
| T'aian-fu | × | × |
| Chang-hsia | × | 13 (F. 13) |
| Acheng (W. of a.) | × | 451 (F. 13) |
| | | 928 |

*Shantung Peninsula.*

| | | |
|---|---|---|
| Chefoo | 140 | 323 (F. 15) / 389 (F. 18) |
| Teng-chow-fu | × | 45 (F. 12) |
| Hwang-hsien | × | 100 (F. 12) |
| Laichow | × | 220 (F. 12) |
| Weihsien | × | × |
| Paotou | × | 30 (F. 12) |
| Pingchow | × | 346 (F. 12) |
| Pingtu | × | 50 (F. 12) |
| Kiaochou | × | 61 (F. 18) |
| Yeh-hsien | × | 145 (F. 18) |
| Chimo | × | 95 (F. 18) |
| Chung-yi | × | 81 |
| | | 1562 |

*Totals.*

| | |
|---|---|
| Hei-Lung-Chiang | 8,614 |
| Kirin | 25,232 |
| Feng-t'ien | 3,950 |
| Mukden—Port Arthur | 76 |
| Mukden—Tientsin—Peking | 1,693 |
| Northern Chihli | 74 |
| Peking—Hankow (Chihli portion) | 173 |
| Tientsin—Puk'ou (Chihli and Shantung) | 928 |
| Shantung Peninsula | 1,562 |
| Grand total | 42,302 |


## SUMMARY.

A review of the circumstances of the epidemic leads to the following conclusions: 1. The first outbreak in Manchuria was among men who handled the tarabagan—an animal susceptible to epizoötic plague. 2. Beginning at a definite focus, plague was spread through the three provinces, by these men returning home. 3. Infection was kept up mainly by these coolies travelling in parties and sleeping together in inns under circumstances of constant intimate contact, with plague-stricken cases in their midst. 4. The extreme cold of Manchuria induced an indoor existence. Infection, by breath and personal contact of clothes and belongings, was thus made easy. 5. There is little evidence of infection having been contracted in the open air, otherwise than among groups of coolies. 6. The mortalities have been mainly among groups of south-bound coolies. 7. The next classes affected were the adult males, who stayed in infected inns travelling or mixing with the returning coolies. 8. When introduced into a house, infection often wiped out the whole family. 9. In towns which became thoroughly infected (as at Fuchiatien) by the passing crowds of coolies, the incidence of the disease persisted, and those residents who were affected were nearly all of the poorer classes. 10. That fairly close contact is necessary for conveyance of infection has been exemplified by the comparative immunity enjoyed by Russians living in the midst of the infected railway area at Harbin. The case of every Russian who died was traced to close contact with Chinese of the plague-affected class. 11. The rate of spread was parallel with the rate of travel, as shown by the early infection of places along the railway and those in close communication with it (e.g., Hu-lan-fu and Harbin) as compared with the later infection of such populous towns as Petuna and Kirin. 12. Towns that had adopted preventive measures before they became badly infected—such as Tientsin, Tongshan, and Peking—practically escaped. 13. Isolation of patients and their contacts, and disinfection, when efficiently carried out, have invariably been followed by diminution of the death-rate. 14. Among rats examined at Harbin by Dr. P. Haffkine and in "20,000" rats examined by the Japanese plague staff no instance of plague infection was found.


# THE INTERNATIONAL PLAGUE CONFERENCE.

THE following is the list of delegates to the International Plague Conference, which was opened at Mukden on April 3rd:—

*America (United States of).*—Dr. R. P. Strong and Dr. Oscar Teague.

*Austria-Hungary.*—Dr. Eugen Worell.

*France.*—Dr. C. B. Broquet.

*Germany.*—Dr. Martini.

*Great Britain.*—Dr. R. A. Farrar, Dr. G. F. Petrie, and Dr. G. Douglas Gray.

*Italy.*—Dr. Gine Galeotti, Dr. Erneste Signorelli, and Dr. di Giura.

*Japan.*—Professor Dr. S. Kitasato, Dr. Akira Fujinami, Professor Dr. G. Shibayama, and Dr. Shimose.

*Mexico.*—Dr. Gonzales.

*Netherlands.*—Dr. T. H. Hehewerth.

*Russia.*—Professor D. Zabolotny, Dr. C. Koulecha, Dr. S. T. Zlatogoroff, and Dr. L. Padlevsky.

*China.*—Dr. Wu Lien-teh (chairman), Dr. Ch'uan Shao Ching, Dr. Fang Chin, Dr. Y. S. Wang, Dr. R. A. P. Hill, Dr. W. H. Graham Aspland, Dr. D. Christie, Dr. Arthur Stanley, and Dr. Paul Haffkine.

*Deputies.*—Dr. Woo Wai-U, from Min Cheng Pu; Dr. J. Chabaneix, from Chihli; Dr. S. N. Wong, from Fengtien; Mr. L. S. Wang, from Fengtien; Dr. M. S. Chung, from Kirin; Dr. Wang Hsing-an, from Heilungchiang; Dr. B. Y. Wong, from the Chinese Red Cross Society; and Dr. P. Quincey, from the Shanghai Hospital.

*Secretaries, &c.*—Dr. W. H. Graham Aspland, medical secretary; M. C. H. Lauru, secretary; Mr. Sze Shao-tsang, Chinese secretary; Mr. Tsang Woo-huan, secretary interpreter; Mr. C. Woodhead, official stenographer; and Mr. Li Kway-yoong, assistant.

*Visitors.*—Dr. Charles T. Andrew, Dr. M. Kokcharoff, Dr. C. Kyoske Uyeda, Dr. Paul Woscressensky, Dr. F. Iasienaki, and Mr. Tchu Yao-tso.

*Opening Address by the Viceroy of Manchuria.*

The proceedings commenced by an opening address from His Excellency Hsi Liang, the Viceroy of Manchuria, who said:—

HONOURABLE DELEGATES, LADIES AND GENTLEMEN,—It is with great pleasure that I welcome you to this ancient capital of Mukden. His Majesty the Emperor, prompted by the highest motives of humanity, has invited all the friendly Powers to join this Conference, and I appreciate deeply the sense of duty to, and love for, mankind which has prompted your several Governments to send you so far away from your lands to attend this International Plague Conference. The Chinese Government and people all over this empire will not easily forget the eager response you have shown to the cause of humanity by accepting our invitation to be present, and I sincerely hope that your deliberations during the next few weeks will result in the saving of human lives not only of this country but of others also, should this terrible disease unfortunately break out elsewhere. We Chinese have for a long time believed in an ancient system of medical practice, which the experience of centuries has found to be serviceable for many ailments, but the lessons taught by this epidemic, which until practically three or four months ago had been unknown in China, have been great, and have compelled several of us to revise our former ideas of this valuable branch of knowledge. We feel that the progress of medical science must go hand in hand with the advancement of learning, and that if railways, telegraphs, electric light, and other modern inventions are indispensable to the material welfare of this country, we should also make use of the wonderful resources of Western medicine for the benefit of our people. I am told that even in Europe the views in regard to medical science have changed considerably for the better since the late King Edward VII. of England gave his remarkable address at the International Sanitary Congress held in London in 1884. In the course of his speech, whilst dealing with infectious diseases, he said: "If preventable, why not prevented?" We in China, too, are appreciating the value of that dictum. I trust, and I believe, too, that modern medicine, and especially sanitary science, will in future receive more attention in this country than it has hitherto done, and that we shall be better prepared to deal with similar epidemics when they arise. My great regret is that as many as 40,000 lives have been lost in these provinces, especially including those of some of our foreign doctors, whose unselfish devotion to duty and the welfare of our people I shall always remember. Ladies and Gentlemen of this Conference, you who are so well known in your countries and in the medical world, and have come to Mukden at great sacrifice, I extend you a hearty welcome to this ancient city. This is the first time we have held a conference of this kind, and we trust you will overlook any little detail missed regarding your comfort whilst staying in this city.

Professor D. Zabolotny, one of the representatives of Russia, who followed, was greeted with loud applause. He said:—

YOUR EXCELLENCIES,—I am asked by my fellow delegates to convey their deep appreciation of your kindly words of welcome. We represent ten foreign nations, Powers of the civilised world, who have responded to the invitation of the Imperial Chinese Government to help her in elucidating this problem of plague—the world-wide scourge of mankind. In sending us here our respective Governments extend to China their sympathy, while earnestly hoping that we by our deliberations may help in the adoption of measures which may prove efficient in preventing recrudescence of this virulent malady. Those of us who are epidemiologists and those of us who devote the main part of our life work to the science of bacteriology, all meet upon the common ground of previous inexperience of such a widespread epidemic of pneumonic and septicæmic plague. In living memory a similar occurrence has not happened. But the facts observed during the past six months give us good ground for believing that the well-established rules for the prevention of infection are capable of being adopted in future in such a way as to aid you in fighting another epidemic—an eventuality which, however much we may wish will not occur again, must nevertheless be regarded as a possibility. We congratulate the Imperial Government on the enlightened path it has followed in coping with the situation. Your Excellencies and your able officers are also congratulated on the whole-hearted way you have worked in the cause of your plague-stricken people. The courage and ability shown by the doctors and their plague staff, Chinese and foreign alike, have commanded universal admiration, and we trust that the benefit of scientific medical work as shown in this epidemic will elevate in your Empire our noble profession and make a calling worthy of being followed by the best of your young men. We thank your Excellency most heartily for all the many arrangements you have made for our comfort. We are thus enabled to carry out work under the happiest circumstances, which will contribute not a little to the harmony of our proceedings. Not only have we appreciated your Excellency's sentiments, but we are also impressed by the address from your August Emperor and his Central Government so ably delivered by Mr. Commissioner Sze, to whom, in passing, we would take this opportunity of expressing our indebtedness. We have listened with great gratification to the kindly message of welcome sent to us by His Imperial Highness the Prince Regent. In the name of my fellow delegates, I beg your Excellency to convey our respectful duty to His Imperial Majesty the Emperor of China, and our thanks for the welcome so graciously extended to us.

On April 4th Mr. Wu Lien-teh, M.D. Cantab. (better known in this country as Dr. Gnoh Lean Tuck), delivered his address as chairman of the Conference, which will be found in full in this issue of THE LANCET.

## THE LONDON COUNTY COUNCIL AND MEDICAL AFFAIRS.

*Medical Inspection and Treatment of London School Children.*

THE recommendation of the Education Committee to the London County Council to give the Board of Education, by way of reply to its criticisms of present arrangements for medical treatment of school children, a definite assurance that a complete scheme will be brought into at least partial operation by October next, and the Finance Committee's counter-recommendation that no such undertaking should be given,[1] was discussed at the meeting of the Council on April 11th. The hint contained in the Finance Committee's report that "it is undesirable on financial grounds that the optional service of medical treatment should be regarded as in the same category as the obligatory service of medical inspection" found definite expression in an amendment moved by Mr. Hayes Fisher to inform the Board of Education that the Council must "reserve its liberty to terminate its arrangements for any medical treatment in the absence of an undertaking at an early date that the main portion of this expenditure will be borne by the national exchequer." The discussion was quite short and took the form of persuasive speeches addressed to Mr. Fisher by members of the Education Committee, irrespective of political party, urging him not to press his amendment, which was variously described as "ill-advised," "undiplomatic," and "a veiled threat to the Government." Mr. Hayes Fisher, however, persisted, and the amendment went to a division, resulting in an equality of voting. The chairman declined to exercise a casting vote, and the amendment fell to the ground. The assurance to the Board of Education was then modified as follows and approved: "That the Council has already put into operation the scheme of medical inspection approved on Nov. 1st, 1910, involving the appointment of 100 quarter-time doctors; further questions affecting the more efficient control of the inspecting staff are still under consideration; and the Council will ensure that by October, 1911, the scope of the medical treatment scheme will be clearly defined and that substantial progress will have been made towards its efficient working."

[1] THE LANCET, April 8th, p. 959.

*Suggested Legislation in regard to the Feeble-minded and Inebriates.*

The London County Council has appointed a deputation to lay before the Home Secretary its views, definitely formulated in December last,[2] as to the legislation needed to give effect to the report of the Royal Commission on the Care and Control of the Feeble-minded. At the suggestion of the Education and Public Control Committees, the deputation will also urge that authority should be conferred on the Council to enable it to make provision for persons lacking in moral sense, and that the law relating to inebriates should be strengthened.

*Extended Control of Mentally Defective Persons.*

The Education Committee stated that experience of the working of special schools for the mentally defective had been convincing as to the undesirability of withdrawing mentally defective children from control on their attaining the age of 16 years. There was an extremely urgent need for legislation to enable the Council to make provision for children lacking in moral sense, especially elder girls, who were considered unfit for ordinary or special schools. If provision were made only for the most pressing cases of the elder morally defective girls accommodation would be required immediately for at least 30, and might have to be found eventually for 100. The capital cost would be about £150 per child, and the cost of maintenance 10*s.* per week, less an average contribution of 1*s.* per week from parents. The Council had permissive powers to provide institutions for mentally defective children up to the age of 16, but it had no power to send children to, or retain them in, such institutions against the will of their parents. Until such power existed and the children could be retained, as the Royal Commission suggested, up to at least 21 years of age, the committee could not recommend the exercise of the existing permissive powers. The General Purposes Committee, reporting concurrently, expressed the view that legislation with regard to persons lacking in moral sense should not be restricted to those under 21 years of age, but should cover all such persons irrespective of age, and the Council decided to extend the reference to the deputation accordingly.

*Amendment of the Inebriates Acts.*

Upon the question of amendment of the Inebriates Acts the Public Control Committee submitted the conclusions arrived at as the result of ten years' administration of these statutes. The work done at the Farmfield Reformatory for Inebriate Women, opened in 1900, was described in some detail, and the committee said that, notwithstanding the attempts made to exclude women considered incapable of reform, a very large percentage of those admitted proved quite unsuited for detention there. Attempts to classify the cases committed from the courts and to deal with them at different institutions had also proved unsuccessful, and the committee attributed this to the length of time that the majority of the women had indulged in alcoholic excess, the defective mental condition of a large number of them, the difficulty of finding them suitable employment after discharge, and the unsatisfactory state of the law relating to inebriates. Inebriates of the recidivist type had become thoroughly degraded owing to repeated prison sentences, and were hopeless from a reform point of view. The indeterminate sentence to a reformatory was the only method of treatment suitable for this type of case. As to weak-minded or "borderland" cases, as long ago as 1900 the Council called attention to the unsuitability for treatment at certified reformatories of these cases. Experience had proved conclusively that inebriates of the recidivist and feeble-minded type could never be fit for sustained self-dependence. Whilst under treatment at a reformatory they were well-conducted, happy, and often touchingly grateful for what was being done for them, and it was but a mistaken kindness if, after being restored to health and given some taste of a decent life, they were permitted to return to the misery and degradation from which they had come. The following particulars related to the first 600 cases committed to Farmfield: 19·1 per cent. doing well; 2·7 per cent. did well for a considerable period; 45·5 per cent. relapsed; 15·0 per cent. cannot be traced; 7·7 per cent. transferred or unmanageable; 3·2 per cent. insane; 1·1 per cent. leading an immoral life; 2·7 per cent. dead; and 1·5 per cent. still at the reformatory. Although these results were so unsatisfactory, it must not be assumed that the Council's efforts had been entirely wasted, as the treatment had been very valuable in many respects. While the law remained as at present it was clearly the duty of the Council to continue to do what was possible for these people, but it would be wrong to acquiesce permanently in such a state of affairs. While speedy legislation on the whole question seemed unlikely, the Government might be induced to deal separately with the comparatively small matter of the feeble-minded inebriate. In that event the question would arise whether such persons were not really of the same class as "criminal lunatics," and how far the cost of their maintenance should be borne by the State. It might be argued that the experiment of dealing with inebriates having been tried for a number of years and having so far failed, the public should not be put to further expense in the matter. It must be borne in mind, however, that expenditure upon inebriates was by no means a new or avoidable charge upon public funds. As the Departmental Committee pointed out, "When allowed the comparative freedom which enables them to commit repeated offences inebriates are already a serious financial burden upon the community, to an extent not perhaps fully realised." The charges connected with the conviction and imprisonment of feeble-minded inebriates amounted to between £20 and £30 per case per annum. The Public Control Committee was of opinion that the present law should be amended to provide—

1. For persons who appear to be developing into habitual drunkards to be submitted to reformatory treatment at the earliest possible moment after they begin drinking to excess.
2. For the prolonged detention of inebriates of the criminal and recidivist type who, after ample opportunity for reform, have proved to be insusceptible to reformatory influence.
3. For the institution of a system of reformatory treatment for short periods of three months and upwards of inebriates when first they come within the scope of the law.
4. That the State should bear the whole cost of providing for all inebriates committed by the courts.

The Council endorsed these suggestions.

[2] THE LANCET, Dec. 10th, 1910, p. 1717.

## GENERAL MEDICAL COUNCIL ELECTION, 1911.

CANDIDATURE OF DR. S. C. LAWRENCE.

Dr. S. C. Lawrence, medical officer of health of Edmonton, has issued the following address to practitioners in opening his candidature for the vacant seat on the General Medical Council as a Direct Representative for England:—

LADIES AND GENTLEMEN,—I have been nominated by some of my numerous friends "as a proper person to be elected to the General Council of Medical Education and Registration of the United Kingdom by the registered medical practitioners resident in England and Wales." I have given my consent to this nomination, and my formal declaration of consent will be delivered to the Registrar of the Council before this address appears in print.

My friends are kind enough to say that my record of work on behalf of the profession justifies them in believing that I could be a useful member of the General Medical Council. They refer particularly to what I have done as honorary secretary and member of the executive of the Society of Members of the Royal College of Surgeons of England, and as honorary secretary (Home Counties Branch) and member of the Council of the Society of Medical Officers of Health for some years past. This voluntary work, though at times arduous and trying, I have been stimulated to do by an earnest desire to improve the position of my brother practitioners, and if you send me by your votes to represent you in our Medical Parliament, I shall devote all the energy and ability I possess to persuade the Council to take something more than an academic interest in the welfare of "the man in practice."

We are all aware that, in the case of most licensing bodies, their interest in our welfare disappears after they have received our last fees and handed us a legal qualification to practise. If this were not true, such defensive bodies as the London and Counties Medical Protection Society or the Medical Defence Union would not be now in existence. As I live in a suburb of London and am only a part-time medical officer of health, it will be easy for me to put in a regular attendance, not only at the formal Council meetings in May

and November of each year, but at the more important committee meetings, where "the spade work" of the Council is done. It is most difficult for anyone living many miles from London to attend regularly, however zealous he may be.

These are critical times for the rank and file of the profession, and in my opinion the General Medical Council should take an *active* part on your behalf in moulding legislation which, if not altered and wisely amended, will as surely decrease your incomes as it will certainly increase your work and responsibilities. It is therefore most important that on this occasion you should show neither apathy nor neglect to exercise your privilege of voting for the candidate whom you judge will best represent you.

I am, ladies and gentlemen, your willing servant,

SIDNEY CAMERON LAWRENCE.

22, Latymer-road, Lower Edmonton, London, N.,
April 24th, 1911.

### CANDIDATURE OF MR. GEORGE JACKSON.

At a meeting of the Provisional Committee of the newly organised Imperial Medical Reform Union, held at 49, Berners-street, W., on April 20th, Dr. Thomas Dutton in the chair, it was unanimously resolved, on the proposition of Mr. George Brown, seconded by Mr. A. P. Murtz, to support the candidature of Mr. George Jackson of Plymouth for the seat at the General Medical Council now vacant through the death of Dr. L. S. McManus.

### CANDIDATURE OF DR. ARTHUR HAWKYARD.

*To the Editor of* THE LANCET.

SIR,—May we, through the medium of your columns, commend to our fellow practitioners the candidature of Dr. Arthur Hawkyard for the vacant seat on the General Medical Council. Dr. Hawkyard has been President of the Leeds and District Medical Practitioners' Association since its foundation, and has done a very considerable amount of useful work for the medical profession of Leeds through this body. His experience as a general practitioner has brought him into contact with all kinds of practice, including clubs, Poor-law, and other contract work, and so renders him capable of appreciating the needs and difficulties of all classes of medical men. He is also a man of wide experience, with a comprehensive knowledge of public life, having served on the Leeds city council and board of guardians for many years; he is at present a magistrate of the city, and has been called to the Bar. His practical common-sense, decided grasp of the requirements of the general practitioner, sound judgment, and firm convictions would render him a great acquisition on the Council to all practising medical men.

We are, Sir, yours faithfully,

E. ALLAN WILSON,
H. DE C. WOODCOCK,
Hon. Secs., Leeds and District Medical Practitioners' Association.

April 25th, 1911.

## VITAL STATISTICS.

### HEALTH OF ENGLISH TOWNS.

IN 77 of the largest English towns 7623 births and 5222 deaths were registered during the week ending April 15th. The annual rate of mortality in these towns, which had been equal to 15·4 and 15·1 per 1000 in the two preceding weeks, rose to 15·9 in the week under notice. In London the death-rate during the week was equal to 14·4 per 1000 compared with 15·8 and 14·9 in the two previous weeks. The annual death-rates during the week under notice in the other large towns ranged from 7·9 in Reading, 8·6 in East Ham, 8·8 in Ipswich, and 9·2 in Hornsey and in Walthamstow, to 23·0 in Wigan, 23·2 in Stockton-on-Tees, 24·7 in Bootle, and 30·2 in Middlesbrough. The 5222 deaths from all causes in the 77 towns during the week under notice showed an increase of 242 upon the number returned in the previous week, and included 552 which were referred to the principal epidemic diseases, against 661 and 571 in the two preceding weeks; of these 552 deaths, 288 resulted from measles, 122 from whooping-cough, 55 from infantile diarrhœa, 50 from diphtheria, 18 from enteric fever, 18 from scarlet fever, and 1 from small-pox. The annual death-rate in the 77 towns from these epidemic diseases averaged 1·7 per 1000, against 2·0 and 1·7 in the two preceding weeks. The fatal cases of measles in the 77 towns, which had steadily declined from 474 to 328 in the five preceding weeks, further declined to 288 in the week under notice; the highest annual death-rates from this disease among the towns were 2·3 in Rotherham and in Gateshead, 2·4 in Devonport and in Aston Manor, and 4·4 in Rhondda. The deaths from whooping-cough, which had been 136, 141, and 111 in the three preceding weeks, rose to 122 during the week under notice, and caused the highest death-rates of 1·3 in Coventry and in Hull, 1·7 in Wigan, 1·8 in York, and 1·9 in Stockton-on-Tees. The 55 deaths of infants under 2 years of age from diarrhœa exceeded by 11 the number returned in the previous week. The 50 deaths referred to diphtheria only slightly exceeded the numbers recorded in the three preceding weeks, and included 15 in London and its suburban districts, and 3 each in Derby, Bolton, and Salford. The deaths attributed to enteric fever, which had been 14, 15, and 16 in the three preceding weeks, further rose to 18 during the week under notice, and included 2 each in Wigan, Manchester, Salford, and Rhondda. The 18 fatal cases of scarlet fever were 4 below the number returned in the previous week, and included 4 in Liverpool and 3 in London. The death from small-pox belonged to London (Borough of Poplar). The number of scarlet fever patients under treatment in the Metropolitan Asylums and the London Fever Hospital, which had steadily declined in the eight preceding weeks from 1276 to 991, had further fallen to 982 on Saturday, April 15th; 125 new cases of this disease were admitted to these hospitals during the week under notice, against 125 and 100 in the two preceding weeks. The Metropolitan Hospitals also contained on Saturday, April 15th, 861 cases of measles, 301 of whooping-cough, 831 of diphtheria, 16 of enteric fever, and 10 of small-pox. The 1359 deaths from all causes in London in the week under notice showed a decline of 48 from the number in the previous week, and included 279 which were referred to diseases of the respiratory system, against 323 and 305 in the two previous weeks; 11 deaths were directly referred to influenza. In the 77 towns 180 deaths resulted from different forms of violence during the week, against numbers increasing from 151 to 170 in the three preceding weeks; and 376 inquest cases were registered. The causes of 60, or 1·1 per cent., of the deaths registered in the 77 towns during the week were not certified either by a registered medical practitioner or by a coroner. All the causes of death were duly certified in Leeds, Bristol, West Ham, Bradford, Leicester, Salford, Portsmouth, and in 43 other smaller towns; the 60 uncertified causes of death in the 77 towns in the week under notice included 13 in Liverpool, 7 in Birmingham, 4 in Manchester, 4 in Gateshead, and 3 in Burnley.

In 77 of the largest English towns 7490 births and 5060 deaths were registered during the week ending April 22nd. The annual rate of mortality in these towns, which had been equal to 15·1 and 15·9 per 1000 in the two preceding weeks, declined again to 15·4 in the week under notice. In London the death-rate during the week was equal to 15·8 per 1000. The annual death-rates during the week under notice in the other large towns ranged from 6·7 in Northampton, 7·6 in Hastings, 7·7 in Handsworth, and 7·9 in Reading, to 19·4 in Swansea, 22·1 in Liverpool, 25·4 in Middlesbrough, and 26·5 in Tynemouth. The 5060 deaths from all causes in the 77 towns during the week under notice showed a decline of 162 from the high number in the previous week, and included 538 which were referred to the principal epidemic diseases, against numbers declining from 702 to 552 in the six preceding weeks; of these 538 deaths, 268 resulted from measles, 134 from whooping-cough, 63 from infantile diarrhœa, 44 from diphtheria, 15 from enteric fever, and 14 from scarlet fever, but not one from small-pox. The mean annual death-rate from these epidemic diseases in the 77 towns was equal to 1·6 per 1000, and showed a further decline from the rate in recent weeks. The fatal cases of measles in the 77 towns, which had steadily declined in the six preceding weeks from 474 to 288, further fell to 268 in the week under notice; the highest annual death-rates from this disease among these towns were 2·8 in West Ham, 2·9 in Stockton-on-Tees, 3·6 in Devonport, and 3·7 in Rhondda. The 134 deaths from whooping-cough showed a further increase upon the numbers in the two previous weeks, and caused the highest death-rates of

1·1 in Bristol, Wigan, and Blackburn, and 1·8 in Tynemouth. The 63 deaths of infants under two years of age attributed to diarrhœa also exceeded the numbers in recent weeks, and included 27 in London and its suburban districts. The deaths referred to diphtheria, which had been 49 and 50 in the two previous weeks, declined last week to 44, and included 21 in London and its suburban districts, 4 in Leeds, and 2 each in Manchester, Southampton, and Plymouth. The 15 deaths referred to enteric fever were fewer by 3 than the number in the previous week; 3 occurred in Halifax and 2 in Stockport. Of the 14 fatal cases of scarlet fever, fewer than in any previous week of this year, 4 occurred in London. The number of scarlet fever patients under treatment in the metropolitan asylums and the London Fever Hospital, which had steadily declined in the nine preceding weeks from 1276 to 982, were 995 on Saturday last; 155 new cases of this disease were admitted to these hospitals during the week under notice, against 100 and 125 in the two preceding weeks. These hospitals also contained 840 cases of measles, 842 of diphtheria, 299 of whooping-cough, 17 of enteric fever, and 7 of small-pox on Saturday, the 22nd inst. The 1487 deaths from all causes in London in the week under notice exceeded the number in the previous week by 128, and included 323 which were referred to diseases of the respiratory system, against 305 and 279 in the two previous weeks; only 3 deaths were directly referred to influenza. In the 77 towns, 198 deaths were returned from different forms of violence, showing a further slight increase upon the numbers in recent weeks; and 424 inquest cases were registered. The causes of 36, or 0·7 per cent., of the deaths registered in the 77 towns during the week were not certified either by a registered medical practitioner or by a coroner. All the causes of death were duly certified in London and in its eight suburban districts, in Manchester, Leeds, Bristol, Bradford, Newcastle-on-Tyne, Nottingham, Stoke-on-Trent, Salford, and in 45 other smaller towns; the 36 uncertified causes of death in the 77 towns in the week under notice included 8 in Birmingham, 7 in Liverpool, 6 in Sheffield, and 2 both in Halifax and in Barrow-in-Furness.

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### HEALTH OF SCOTCH TOWNS.

In eight of the principal Scotch towns 859 births and 625 deaths were registered during the week ending April 15th. The annual rate of mortality in these towns, which had been equal to 15·6 and 17·3 per 1000 in the two preceding weeks, declined to 17·0 in the week under notice, but was 1·1 per 1000 above the mean rate during the same period in the 77 English towns. The annual death-rates in the eight Scotch towns ranged from 13·1 and 14·3 in Leith and Aberdeen, to 20·4 in Greenock and 21·9 in Paisley. The 625 deaths from all causes in the eight towns during the week under notice showed a decline of 10 from the number in the previous week, and included 74 which were referred to the principal epidemic diseases, against 43 and 67 in the two preceding weeks; these 74 deaths were equal to an annual rate of 2·0 per 1000, which was 0·3 above the rate from the same diseases in the 77 English towns; the highest rates from these diseases in the Scotch towns in the week under notice were 2·8 in Perth and 3·8 in Paisley. Of these 74 deaths from epidemic diseases in the eight towns, 41 resulted from whooping-cough, 11 from measles, 11 from diarrhœa, 8 from diphtheria, 2 from enteric fever, and 1 from scarlet fever, but not one from small-pox. The fatal cases of whooping-cough, which had been 28 and 41 in the two preceding weeks, were again 41 in the week under notice, of which 27 occurred in Glasgow, 5 in Paisley, and 3 in Dundee. The 11 deaths from measles showed a marked increase upon the numbers registered in any week of the current year; 9 deaths were recorded in Glasgow and 2 in Edinburgh. The 11 deaths attributed to diarrhœa (including 9 of infants under two years of age) were slightly higher than the numbers in the two preceding weeks, and included 7 in Glasgow and 2 in Paisley. The deaths referred to diphtheria, which had been 3 and 6 in the two preceding weeks, further rose during the week under notice to 8, and included 2 each in Glasgow, Edinburgh, Dundee, and Perth. Of the 2 deaths from enteric fever, 1 occurred in Glasgow and 1 in Dundee; the fatal case of scarlet fever was recorded in Glasgow. The deaths referred to diseases of the respiratory system in the eight towns, which had been 109 and 153 in the two preceding weeks, declined to 131 in the week under notice, but were 5 above the number in the corresponding week of last year. The 19 deaths attributed to different forms of violence showed a slight decline upon the numbers recorded in the three preceding weeks; 183, or 29 per cent., of the 625 deaths from all causes occurred in public institutions. The causes of 18, or 2·9 per cent., of the deaths registered in the eight towns during the week were not certified or not stated; in the 77 English towns during the week under notice the proportion of uncertified causes of death did not exceed 1·1 per cent.

In eight of the principal Scotch towns 916 births and 612 deaths were registered during the week ending April 22nd. The annual rate of mortality in these towns, which had been equal to 17·3 and 17·0 per 1000 in the two preceding weeks, further declined to 16·7 in the week under notice. During the first three weeks of the current quarter the annual rate in these eight towns averaged 17·0 per 1000, and exceeded by 1·5 the mean annual rate during the same period in the 77 largest English towns. The annual death-rates in the eight Scotch towns during the week under notice ranged from 10·5 and 14·3 in Aberdeen and Leith, to 25·2 in Paisley and 27·4 in Greenock. The 612 deaths from all causes in the eight towns during the week under notice showed a further decline of 13 from the numbers in the two preceding weeks, and included 81 which were referred to the principal epidemic diseases, against 43, 67, and 74 in the three preceding weeks; these 81 deaths were equal to an annual rate of 2·2 per 1000, and exceeded by 0·6 the rate from the same diseases in the 77 English towns; the highest rates from these diseases in the Scotch towns during the week under notice were 2·8 in Perth and 8·2 in Paisley. Of these 81 deaths from epidemic diseases in the eight towns, 56 resulted from whooping-cough, 10 from diarrhœa, 7 from measles, 6 from diphtheria, and 2 from scarlet fever, but not one either from enteric fever or small-pox. The fatal cases of whooping-cough, which had been 41 in each of the two previous weeks, rose to 56 in the week under notice, of which 28 occurred in Glasgow, 14 in Paisley, and 8 in Edinburgh. The 10 deaths attributed to diarrhœa included 9 of infants under two years of age, of which 6 were recorded in Glasgow. The fatal cases of measles, which had been 5 and 11 in the two previous weeks, declined again to 7 last week, of which 3 occurred in Glasgow and 2 in Edinburgh. The 6 deaths referred to diphtheria were fewer by 2 than the number in the previous week, and included 3 both in Glasgow and in Edinburgh. A fatal case of scarlet fever was returned in Glasgow and in Paisley. The deaths referred to diseases of the respiratory system in the eight towns, which had been 153 and 131 in the two previous weeks, were 136 in the week under notice, and exceeded by 44 the number in the corresponding week of last year. The deaths attributed to different forms of violence, which had been 20 and 19 in the two previous weeks, rose to 22 last week; and 172, or 28 per cent., of the 612 deaths from all causes occurred in public institutions. The causes of 9, or 1·5 per cent., of the deaths registered in the eight towns during the week were not certified or not stated; in the 77 English towns during the same week the proportion of uncertified causes of death did not exceed 0·7 per cent.

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### HEALTH OF IRISH TOWNS.

In the 22 town districts of Ireland, having an estimated population of 1,163,596 persons, 529 births and 452 deaths were registered during the week ending April 15th. The annual rate of mortality in these towns, which had been 21·2, 20·7, and 22·4 in the three preceding weeks, declined to 20·3 per 1000 in the week under notice. During the same period the death-rate did not exceed 15·9 in the 77 English towns and 17·0 in the eight Scotch towns. The annual death-rate during the week in the Irish towns was equal to 21·1 in Dublin and in Belfast (against 14·4 in London), 27·4 in Cork, 26·1 in Londonderry, 17·8 in Limerick, and 13·6 in Waterford; in the 16 smallest of the Irish towns the mean annual death-rate during the week was equal to 13·6 per 1000. The 452 deaths from all causes in the 22 towns in the week under notice showed a decrease of 47 upon the number recorded in the previous week, and included 36 which were referred to the principal epidemic diseases, against 21 and 25 in the two preceding weeks; these 36 deaths were equal to an annual rate of 1·6 per 1000, which was 0·1 below

the mean rate from the same diseases in the 77 English towns. Of these 36 deaths in the Irish towns from the principal epidemic diseases, 13 resulted from whooping-cough, 8 from measles, 5 from diphtheria, 4 from scarlet fever, 3 from enteric fever, and 3 from diarrhœa, but not one from small-pox. The deaths from whooping-cough, which had been 8 in each of the two preceding weeks, rose to 13 during the week under notice; 6 deaths were registered in Dublin, 4 in Londonderry, and 3 in Belfast. The 8 fatal cases of measles were 6 more than the number in the previous week, and included 7 in Dublin and 1 in Belfast. The 5 deaths attributed to diphtheria corresponded with the number in the previous week; 2 deaths were recorded in Dublin, 2 in Belfast, and 1 in Kilkenny. The 4 fatal cases of scarlet fever and 1 of enteric fever occurred in Dublin. The deaths in the 22 towns referred to diseases of the respiratory system, which had steadily increased from 90 to 121 in the four preceding weeks, were 120 in the week under notice. Of the 452 deaths from all causes 160, or 35 per cent., were recorded in public institutions. The causes of 9, or 2·0 per cent., of the deaths in the 22 towns were not certified either by a registered medical practitioner or by a coroner after inquest; the proportion of uncertified causes of death in the week under notice did not exceed 1·1 in the 77 English towns, and and was 2·9 per cent. in the eight principal Scotch towns.

In 22 town districts of Ireland, having an estimated population of 1,163,596 persons, 547 births and 490 deaths were registered during the week ending April 22nd. The annual rate of mortality in these towns, which had been equal to 22·4 and 20·3 per 1000 in the two preceding weeks, rose again to 22·0 in the week under notice. During the first three weeks of the current quarter the annual death-rate in these towns averaged 21·6 per 1000; the mean rate during the same period in the 77 English towns did not exceed 15·5 and in the eight Scotch towns 17·0 per 1000. The annual death-rate during the week under notice in the Irish towns was equal to 23·3 in Dublin (against 15·8 in London), 20·2 in Belfast, 21·2 in Cork, 17·8 in Londonderry, 28·7 in Limerick, and 31·2 in Waterford; in the 16 smallest of the Irish towns the mean annual death-rate during the week was equal to 21·4 per 1000. The 490 deaths from all causes in the 22 towns during the week exceeded by 38 the number in the previous week, and included 30 which were referred to the principal epidemic diseases, against 21, 25, and 36 in the three preceding weeks; these 26 deaths were equal to an annual rate of 1·2 per 1000, which was 0·4 below the mean rate from the same diseases in the 77 English towns. Of these 26 deaths in the Irish towns from the principal epidemic diseases, 11 resulted from measles, 6 from whooping-cough, 5 from diphtheria, 6 from infantile diarrhœa, and 1 each from enteric fever and scarlet fever, but not one from small-pox. The fatal cases of measles, which had been 2 and 8 in the two previous weeks, further rose to 11 in the week under notice, all of which occurred in Dublin. The 6 deaths from whooping-cough showed a decline of 7 from the number in the previous week, and included 4 in Londonderry, and 2 in Belfast. Of the 6 deaths attributed to infantile diarrhœa, 3 occurred in Dublin, 2 in Belfast, and 1 in Londonderry. The 5 deaths referred to diphtheria corresponded with the number in each of the two previous weeks, and included 3 in Dublin and 1 each in Belfast and Clonmel. The fatal case each of enteric fever and scarlet fever occurred in Dublin. The deaths in the 22 towns referred to diseases of the respiratory system, which had been 121 and 120 in the two previous weeks, rose to 136 during the week under notice. Of the 490 deaths from all causes, 150, or 31 per cent., were recorded in public institutions. The causes of 10, or 2·0 per cent., of the deaths in the 22 towns were not certified either by a registered medical practitioner or by a coroner after inquest; the proportion of uncertified causes of death in the week under notice did not exceed 0·7 in the 77 English towns, and was 1·5 per cent. in the eight principal Scotch towns.

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## VITAL STATISTICS OF LONDON DURING MARCH, 1911.

IN the accompanying table will be found summarised complete statistics relating to sickness and mortality in the City of London and in each of the metropolitan boroughs. With regard to the notified cases of infectious diseases, it appears that the number of persons reported to be suffering from one or other of the nine diseases specified in the table was equal to an annual rate of 3·9 per 1000 of the population, provisionally estimated at 4,912,054 persons in the middle of this year. In the three preceding months the rates were 4·3, 4·1, and 4·1 per 1000 respectively. The lowest rates last month were recorded in the City of Westminster, St. Marylebone, Hampstead, Stoke Newington, and the City of London; and the highest rates in Chelsea, Stepney, Poplar, Wandsworth, Greenwich, and Woolwich. Thirty cases of small-pox were notified last month, of which 13 belonged to Stepney, 6 to Poplar, 3 each to Hackney, Shoreditch, and Bethnal Green, and 1 each to Camberwell and Deptford. The prevalence of scarlet fever showed a slight decline from that recorded in the preceding month; among the several metropolitan boroughs the greatest proportional prevalence of this disease was recorded in Chelsea, Holborn, Bermondsey, Wandsworth, and Woolwich. The Metropolitan Asylums Hospitals contained 1012 scarlet fever patients at the end of last month, against 1574, 1280, and 1224 at the end of the three preceding months; the weekly admissions averaged 124, against 155, 130, and 142 in the three preceding months. Diphtheria also was rather less prevalent than it had been in the preceding month; this disease showed the greatest proportional prevalence in Fulham, Chelsea, St. Pancras, Bethnal Green, Stepney, and Greenwich. The number of diphtheria patients remaining under treatment in the Metropolitan Asylums Hospitals at the end of last month was 881, against 827, 842, and 902 at the end of the three preceding months; the weekly admissions averaged 107 last month, against 95, 107, and 120 in the three preceding months. Enteric fever again showed a marked decline as compared with other recent months; among the several metropolitan boroughs this disease was proportionally most prevalent in St. Pancras, Islington, Bethnal Green, Stepney, Poplar, and Wandsworth. There were 32 enteric fever patients under treatment in the Metropolitan Asylums Hospitals at the end of last month, against 88, 68, and 41 at the end of the three preceding months; the weekly admissions averaged 3, against 7 in each of the two preceding months. Erysipelas was proportionally most prevalent in Paddington, Finsbury, Shoreditch, Stepney, Southwark, and Lambeth. The 27 cases of puerperal fever notified during the month included 5 in Stepney, 3 each in Hackney, Wandsworth, and Woolwich, and 2 in Fulham and in Bermondsey. The 19 cases notified as cerebro-spinal meningitis included 3 each in Islington and Battersea, and 2 each in Hackney, Shoreditch, Stepney, and Lambeth.

The mortality statistics in the table relate to the deaths of persons actually belonging to the several boroughs, the deaths occurring in institutions having been distributed among the boroughs in which the deceased persons had previously resided; the death-rates from all causes are further corrected for variations in the sex and age constitution of the population of the several boroughs. During the five weeks ending April 1st the deaths of 7166 London residents were registered, equal to a corrected annual death-rate of 16·0 per 1000, against 15·8, 16·5, and 17·6 per 1000 in the three preceding months. The death-rates last month ranged from 8·9 in Hampstead, 9·9 in Lewisham, 11·1 in Greenwich, 11·8 in Fulham, 13·2 in the City of Westminster, and 13·3 in Hammersmith, to 20·0 in the City of London, 20·6 in Holborn, 22·1 in Bethnal Green, 22·4 in Finsbury, 22·6 in Poplar, and 26·0 in Shoreditch. The 7166 deaths from all causes included 8 which were referred to small-pox, 843 to measles, 15 to scarlet fever, 61 to diphtheria, 185 to whooping-cough, 3 to enteric fever, and 69 (among children under two years of age) to diarrhœa and enteritis. No death from any of these diseases was recorded in the City of London; among the metropolitan boroughs they caused the lowest death-rates in Westminster, Hampstead, Greenwich, Lewisham, and Woolwich; and the highest rates in Stoke Newington, Shoreditch, Bethnal Green, Stepney, Poplar, and Wandsworth. The 843 deaths from measles were as much as 566 in excess of the corrected average number in the corresponding period of the five preceding years; the greatest proportional mortality from this disease was recorded in Stoke Newington, Hackney, Finsbury, Shoreditch, Bethnal Green, Stepney, Poplar, and Wandsworth. The 15 fatal cases of scarlet fever were 28 below the corrected average number,

## ANALYSIS OF SICKNESS AND MORTALITY STATISTICS IN LONDON DURING MARCH, 1911.

(*Specially compiled for* THE LANCET.)

| CITIES AND BOROUGHS. | Estimated population in the middle of 1911. | NOTIFIED CASES OF INFECTIOUS DISEASE. | | | | | | | | | | | DEATHS FROM PRINCIPAL INFECTIOUS DISEASES.‡ | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Small-pox. | Scarlet fever. | Diphtheria.* | Typhus fever. | Enteric fever. | Other continued fevers. | Puerperal fever. | Erysipelas. | Cerebro-spinal meningitis. | Total. | Annual rate per 1000 persons living. | Small-pox. | Measles. | Scarlet fever. | Diphtheria.* | Whooping-cough. | Enteric fever. | Diarrhœa and enteritis under 2 years). | Total. | Annual rate per 1000 persons living. | Deaths from all causes. | Death-rate per 1000 living.† |
| **LONDON** | 4,912,054 | 30 | 710 | 660 | — | 46 | 2 | 27 | 360 | 19 | 1854 | 3·9 | 8 | 843 | 15 | 61 | 185 | 3 | 69 | 1184 | 2·5 | 7166 | 16·0 |
| *West Districts.* | | | | | | | | | | | | | | | | | | | | | | | |
| Paddington | 154,072 | — | 23 | 12 | — | 2 | — | — | 15 | 1 | 53 | 3·6 | — | 21 | — | 2 | 10 | — | 2 | 35 | 2·4 | 216 | 15·6 |
| Kensington | 185,607 | — | 19 | 30 | — | — | — | — | 7 | — | 56 | 3·1 | — | 29 | — | 5 | 7 | — | 5 | 46 | 2·6 | 260 | 15·7 |
| Hammersmith | 129,140 | — | 20 | 13 | — | 1 | 1 | — | 9 | — | 44 | 3·6 | — | 5 | — | 2 | 6 | — | 3 | 16 | 1·3 | 158 | 13·3 |
| Fulham | 186,190 | — | 22 | 35 | — | 2 | — | 2 | 4 | — | 65 | 3·6 | — | 20 | 1 | 1 | 6 | — | — | 28 | 1·6 | 202 | 11·8 |
| Chelsea | 75,673 | — | 18 | 14 | — | 1 | — | — | 5 | — | 38 | 5·2 | — | 12 | — | — | 1 | — | 1 | 14 | 1·9 | 119 | 17·0 |
| City of Westminster | 165,593 | — | 22 | 11 | — | 2 | — | — | 4 | — | 39 | 2·5 | — | 7 | — | — | 5 | — | 2 | 14 | 0·9 | 188 | 13·2 |
| *North Districts.* | | | | | | | | | | | | | | | | | | | | | | | |
| St. Marylebone | 124,373 | — | 7 | 18 | — | — | — | — | 7 | 1 | 33 | 2·8 | — | 14 | — | — | 5 | — | 2 | 21 | 1·8 | 167 | 14·9 |
| Hampstead | 97,288 | — | 11 | 10 | — | — | — | — | 4 | — | 25 | 2·7 | — | 4 | — | 1 | — | — | — | 5 | 0·5 | 74 | 8·9 |
| St. Pancras | 238,187 | — | 25 | 40 | — | 5 | — | 1 | 19 | 1 | 91 | 4·0 | — | 38 | 1 | 5 | 6 | — | 1 | 51 | 2·2 | 334 | 15·3 |
| Islington | 355,550 | — | 39 | 44 | — | 5 | — | 1 | 21 | 3 | 113 | 3·3 | — | 24 | 1 | 1 | 19 | — | 4 | 49 | 1·4 | 483 | 14·8 |
| Stoke Newington | 55,260 | — | 6 | 1 | — | — | — | — | 4 | — | 11 | 2·1 | — | 12 | 1 | — | 6 | — | — | 19 | 3·6 | 93 | 18·4 |
| Hackney | 242,388 | 3 | 34 | 23 | — | 1 | — | 3 | 13 | 2 | 79 | 3·4 | — | 54 | 3 | 2 | 15 | 1 | — | 75 | 3·2 | 340 | 15·2 |
| *Central Districts.* | | | | | | | | | | | | | | | | | | | | | | | |
| Holborn | 52,484 | — | 12 | 5 | — | — | — | — | 3 | — | 20 | 4·0 | — | 4 | — | — | — | — | 2 | 6 | 1·2 | 96 | 20·6 |
| Finsbury | 93,874 | — | 14 | 9 | — | — | — | 1 | 11 | — | 35 | 3·9 | — | 24 | — | 1 | 2 | — | 3 | 30 | 3·3 | 194 | 22·4 |
| City of London | 16,069 | — | 2 | 1 | — | — | — | — | 1 | — | 4 | 2·6 | — | — | — | — | — | — | — | — | — | 28 | 20·0 |
| *East Districts.* | | | | | | | | | | | | | | | | | | | | | | | |
| Shoreditch | 113,981 | 3 | 13 | 14 | — | — | — | — | 11 | 2 | 43 | 3·9 | — | 53 | 1 | 3 | 5 | — | 2 | 64 | 5·9 | 271 | 26·0 |
| Bethnal Green | 131,855 | 3 | 13 | 24 | — | 2 | — | — | 8 | 1 | 51 | 4·0 | — | 50 | — | 4 | 12 | 1 | 4 | 71 | 5·6 | 277 | 22·1 |
| Stepney | 316,269 | 13 | 29 | 63 | — | 5 | — | 5 | 32 | 2 | 149 | 4·9 | 7 | 82 | 1 | 6 | 11 | — | 9 | 116 | 3·8 | 566 | 19·5 |
| Poplar | 172,917 | 6 | 29 | 27 | — | 6 | — | 1 | 15 | — | 84 | 5·1 | 1 | 106 | 1 | 7 | 6 | — | — | 121 | 7·3 | 363 | 22·6 |
| *South Districts.* | | | | | | | | | | | | | | | | | | | | | | | |
| Southwark | 212,560 | — | 36 | 28 | — | 2 | — | 1 | 28 | — | 95 | 4·7 | — | 21 | 2 | 4 | 9 | — | 4 | 40 | 2·0 | 349 | 17·9 |
| Bermondsey | 126,919 | — | 23 | 15 | — | 1 | — | 2 | 10 | 1 | 52 | 4·3 | — | 8 | 1 | 3 | 4 | — | 1 | 17 | 1·4 | 231 | 19·5 |
| Lambeth | 330,000 | — | 55 | 41 | — | 4 | — | 1 | 32 | 2 | 135 | 4·3 | — | 37 | 1 | 4 | 8 | 1 | 3 | 54 | 1·7 | 443 | 14·4 |
| Battersea | 190,434 | — | 25 | 29 | — | 1 | — | 1 | 13 | 3 | 72 | 3·9 | — | 33 | — | 3 | 8 | — | 5 | 49 | 2·7 | 263 | 15·4 |
| Wandsworth | 314,087 | — | 73 | 46 | — | 5 | 1 | 3 | 22 | — | 150 | 5·0 | — | 127 | 1 | 2 | 14 | — | 6 | 150 | 5·0 | 459 | 16·0 |
| Camberwell | 289,130 | 1 | 26 | 39 | — | 1 | — | 1 | 25 | — | 93 | 3·4 | — | 29 | — | 2 | 7 | — | 6 | 44 | 1·6 | 389 | 14·5 |
| Deptford | 120,715 | 1 | 18 | 15 | — | — | — | — | 10 | — | 44 | 3·8 | — | 8 | — | 1 | 7 | — | 2 | 18 | 1·6 | 162 | 14·7 |
| Greenwich | 114,872 | — | | 23 | — | — | — | 1 | 10 | — | 54 | 4·9 | — | 2 | — | — | 2 | — | — | 4 | 0·4 | 120 | 11·1 |
| Lewisham | 169,078 | — | 28 | 21 | — | — | — | — | 9 | — | 58 | 3·6 | — | 7 | — | 2 | 3 | — | 2 | 14 | 0·9 | 154 | 9·9 |
| Woolwich | 137,489 | — | 48 | 9 | — | — | — | 3 | 8 | — | 68 | 5·2 | — | 12 | — | — | 1 | — | — | 13 | 1·0 | 167 | 13·6 |
| Port of London | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

* Including membranous croup. † The death-rates are corrected for variations in sex- and age-constitution of the populations of the several boroughs, the population of England and Wales being taken as the standard. ‡ Deaths from 'typhus fever' and "other continued fevers" are not now distinguished in the Registrar-General's weekly returns; these two columns are therefore omitted from the Table.

and included 3 in Hackney and 2 in Southwark. The 61 deaths from diphtheria were 11 fewer than the corrected average number; this disease was proportionally most fatal in Kensington, St. Pancras, Shoreditch, Bethnal Green, Poplar, and Bermondsey. The 185 fatal cases of whooping-cough were 20 below the corrected average number; the greatest proportional mortality from this disease was recorded in Paddington, Islington, Hackney, Shoreditch, Bethnal Green, and Deptford. Only 3 deaths from enteric fever were recorded last month, the average number in the corresponding period of the five preceding years being 17; these 3 deaths belonged respectively to Hackney, Bethnal Green, and Lambeth. The 69 deaths from diarrhœa and enteritis among children under two years of age included 9 in Stepney, 6 in Wandsworth, 6 in Camberwell, 5 in Kensington, 5 in Battersea, and 4 each Islington, Bethnal Green, and Southwark. In conclusion, it may be stated that the aggregate mortality in London last month from the principal infectious diseases (excluding diarrhœa) was nearly 82 per cent. above the average.

## THE SERVICES.

### ROYAL ARMY MEDICAL CORPS.

Lieutenant Stuart McK. Saunders is seconded for service with the Egyptian Army (dated March 26th, 1911). Brevet-Colonel R. S. F. Henderson has been appointed an Honorary Physician to His Majesty the King. Lieutenant-Colonel H. A. Haines, from Portsmouth, has been selected to take charge of the Military Hospital at Chatham. Lieutenant-Colonel Sir Joseph Fayrer, at present stationed at Hong-Kong in charge of the Military Hospital, has been appointed Superintendent of the Royal Infirmary, Edinburgh. Brevet-Lieutenant Colonel O. R. A. Julian, C.M.G., has arrived home from India, tour expired. Lieutenant-Colonel J. V. Salvage, commanding the Military Hospital at Muttra, has been granted four and a half months' general leave of absence home from India. Major R. J. Copeland, commanding the Military Hospital at Darjeeling, has arrived home from India. Major S. F. Clark has been transferred from London to Chester. Major W. G. Beyts, on arrival in India from London, has taken up duty at the Station Hospital, Ranikhet. The following officers have been warned by the War Office to hold themselves in readiness for service abroad during the coming trooping season:—Majors G. S. McLoughlin, C. J. Healy, C. B. Martin, C. F. Wanhill, A. R. O'Flaherty, R. H. Lloyd, and J. M. Stone, D.S.O. Major C. H. Whitestone has been granted six months' leave of absence home from India from May 2nd. Captain A. C. Adderley, from Lichfield, has joined for duty at Harrismith. Captain D. Ahern has been transferred from the Military Hospital at Cairo for duty at Alexandria. Captain A. W. Gater, on return from India, has been posted to Fermoy. Captain J. Fairbairn, from Glasgow, has embarked for a tour of foreign service on the West Coast of Africa (Sierra Leone). Captain A. C. Osburn, from Sheerness, has joined the Military Hospital at Colchester for duty. Captain E. J. Elliot has been transferred from York to Newcastle. Captain G. G. Tabuteau, staff surgeon at Jhansi, has been selected to command the Station Hospital at Jutogh, Simla District. The following Captains have been placed under orders for service abroad during the coming trooping season: W. A. Woodside, Adjutant of the R.A.M.C. School of Instruction, East Anglian Division; J. J. W. Prescott, D.S.O., Adjutant of the R.A.M.C. School of Instruction, Northumbrian Division; A. A. Seedo, L. N. Lloyd, D.S.O., L. Wood, E. P. Connolly, H. S. Roch, C. R. Evans, F. M. Parry, E. P. Sewell, C. H. Straton, J. H. Robinson, E. Bennett, and J. Tobin. Captain A. Fortesque has been granted four months' leave of absence home from India. Lieutenants J. J. H. Beckton and W. B. Hennie have, on arrival in India, been posted to the Second and Fourth Divisions of the Northern Army respectively. Lieutenant J. A. Renshaw has been transferred from Cherat to Bangalore. Lieutenant D. B. McGrigor, from Quetta, has taken up duty at the Station Hospital, Karachi.

### INDIAN MEDICAL SERVICE.

Lieutenant-Colonel W. W. White has arrived home on leave of absence from India. Lieutenant-Colonel W. R. Clark, civil surgeon at Rawalpindi, has been appointed Civil Surgeon at Lahore and Professor of Forensic Medicine and Toxicology at the Government Medical College, Lahore, in succession to Lieutenant-Colonel H. Hendley. Lieutenant-Colonel A. W. Dawson has been granted seven months' leave of absence home from India. Lieutenant-Colonel R. B. Roe, civil surgeon and superintendent of the Lunatic Asylum at Nagpur, Central Provinces, has been placed on special duty under the Principal Medical Officer of the Sixth (Poona) Division. Major T. B. Kelly has been appointed a Specialist in Ophthalmology. Major E. M. Illington has returned to India on completion of his leave of absence. Major E. J. O'Meara, civil surgeon of Naini Tal, has been placed on special duty under the orders of the Government of India. Major A. Fenton, civil surgeon at Mandalay, has been appointed to officiate as First-class Civil Surgeon in succession to Lieutenant-Colonel F. J. Dewes, who has proceeded on leave. Captain E. A. Roberts has been granted an extension of his leave of absence by the Secretary of State for India until July 17th next. Captain A. W. Overbeck-Wright has taken up duty as Superintendent of the Central Prison at Agra during the absence on leave of Lieutenant-Colonel S. H. Henderson. H.E. the Governor of Bombay has appointed Captain J. L. Lunham, civil surgeon of Surat, to officiate as Surgeon to His Excellency during the absence on leave of Captain T. C. Lucas, R.A.M.C.

### SPECIAL RESERVE OF OFFICERS.

*Royal Army Medical Corps.*

Lieutenant George Rollason is seconded for service under the Colonial Office (dated Jan. 4th, 1911).

Reginald Fisher to be Lieutenant (on probation) (dated March 27th, 1911).

### AMERICAN NAVAL MEDICAL SERVICE.

In the *Military Surgeon* for April is a paper by Surgeon A. M. D. McCormick, U.S.N., on the Work of the Fleet-Surgeon, this title denoting not a rank but the staff appointment of the principal medical officer of a fleet in the American navy. It is apparently discussed whether the fleet-surgeon should serve in the flagship of the admiral commanding the fleet, or whether he should serve as commanding officer of the hospital ship which nowadays is always attached to the fleet, and Surgeon McCormick decides that it is in the hospital ship he should be. He would clearly be more in touch with the Commander-in-Chief if he lived in the flagship, and further would not have to separate himself from his command if the hospital ship is sent away to land invalids and hospital cases, but Surgeon McCormick thinks it better he should be attached to the hospital ship, as we have said. Apart from the duties that would fall to him there, his time is otherwise well occupied. He must inspect all the ships of the squadron and report on their sanitation, and has also very thoroughly to inspect the work of the medical officers, examining the work they have done in training men in "first aid," the drill of men in the hospital corps on board, the treatment of the sick, the condition of the medical stores and instruments, the journals, records, and returns. The presence of a hospital ship with the fleet has done much, he says, to improve medical practice in the United States navy, as clinics are held on board. The medical officer of the hospital ship is now its commanding officer. The hospitals on board American ships are large, in the *Michigan* 30 beds are spoken of, besides 4 in the isolation ward. Steam heating apparatus, also steam instrument and dressing sterilisers are mentioned. Surgeon McCormick shrewdly advises that the state of the ventilation of sick bays should be regularly noted, that arguments may be at hand if improvements are required. On the cruise round the world, ventilators are estimated to have been of necessity closed during one-third of the time spent at sea.

### MEMORIAL TO KING EDWARD VII.

The sanctuary of the chapel attached to the Queen Alexandra Military Hospital at Millbank has been lined with alabaster and black marble, and a credence shelf of alabaster has been placed on the south side in memory of the late King. A tablet has also been erected with the following inscription:—

In grateful remembrance of our Sovereign Lord King Edward the Peacemaker, who reigned from January 22nd, 1901, to May 6th, 1910, and who, with Queen Alexandra, honoured the hospital with visits and gifts and attended the dedication of this chapel on the 24th June, 1909.

* Including membranous group. † The death-rates are corrected for variations in sex- and age-constitution of the several boroughs, the population of England and Wales being taken as the standard. ‡ Deaths from "typhus fever" and "other continued fevers" are not now distinguished in the Registrar-General's weekly returns; these two columns are therefore omitted from the Table.

The memorial has been unveiled by Major-General Codrington, commanding the London District.

OVERWORK AT THE PARKHURST MILITARY HOSPITAL.

At an inquest held on the body of a dispenser at the Military Hospital, Parkhurst, on April 24th, the jury returned a verdict to the effect that the deceased had poisoned himself while in an unsound state of mind produced by ill-health and prolonged hours of duty. The coroner having remarked that some of the witnesses looked thin and ill, they stated that they had had to work from 7 A.M. to 11 P.M. seven days a week.

# Correspondence.

"Audi alteram partem."

## THE OLIVER-SHARPEY LECTURES ON HEART FAILURE.

*To the Editor of* THE LANCET.

SIR,—Your correspondence columns are not perhaps the most appropriate place for discussing in detail the many disputable questions interestingly raised by the Oliver-Sharpey lectures in considering Heart Failure. As a "sinner," however, who has not yet been brought to such an appreciation of his shortcomings (to use the theological simile employed by the lecturer) as to seek absolution on the terms offered, there are a few points of practical importance on which I hope I may be permitted to remark in that portion of your journal which rarely goes unread, whatever the fate of more exhaustively treated material.

I do not think I shall be singular in having received the impression that if at one time the mechanical factor in heart disease had too much weight attached to it, Dr. Mackenzie appears to minimise its importance unduly. We have all met with cases of valvular disease, most frequently at the mitral orifice, which have led more or less strenuous lives even to hoar hairs. But if Dr. Mackenzie's experience is that for one valvular lesion which has terminated the life of the subject of it prematurely dozens have not had that effect, his experience differs certainly from my own, and I am inclined to think that in this matter also I am not likely to find myself alone. I believe, therefore, that it will be difficult to persuade either insurance companies, employers of labour, or the authorities of the public services, that cardiac valvular defects and persistent irregularities are any additional recommendation to candidates. No one, so far as I know, disputes that it is the muscular failure rather than the valvular defect which causes death under these circumstances, but surely it will be admitted that it is the increased difficulty of propelling a circulation due to such defect which is the cause of the premature cardiac change and consequent failure in a large number of cases. This is so much like flogging a dead horse that I cannot help feeling I do Dr. Mackenzie injustice in supposing he thinks otherwise.

If one attempts to empty a pail of water with a Higginson's syringe it is the hand which tires, not the caoutchouc bag. But if the bag requires two squeezes instead of one to project the same quantity of water, in consequence of a defective valve, the hand tires in just half the time before its task is over, although such a process frequently repeated may, up to a certain point, induce greater power in the squeezing hand, provided it have sufficient rest at intervals. This analogy, like most analogies, is not perfect, but the importance of the mechanical factor in heart disease requires no other advocacy than the hypertrophy which follows mechanical obstacle, the devolution of the right ventricular muscle which occurs on the transformation of the intra-uterine into the aërial circulation of the infant, and the frequently observed rapid overthrow of an otherwise healthy heart when either the pulmonary or aortic valves are ruptured.

Again, the lecturer's argument from the tricuspid to the mitral valve is not on all fours, as the relation of these chambers to the function of respiration is not the same, and even the anatomical data differ. If, moreover, diving animals exhibit a ventriculo-auricular "safety-valve function," it is no less true that the deep-diving shark has a triple tier of valves guarding the chief arterial outlet, while an aortic aneurysm with sound aortic valves has a very different heart behind it from a similar aneurysm associated with incompetent aortic cusps. It would be out of place to discuss here more fully the condition recently termed by Dr. Thomas Lewis "auricular fibrillation," but I do not suppose those who regard it as the *cause* of ventricular irregularity will deny that it is usually, if not always, a concomitant of *mitral* rather than aortic valvular defect, and I think it has still to be shown that it is a cause rather than a consequence of the ventricular irregularity.

Whatever resemblance may be detected between experimental fibrillation of the auricle and the impotent, if quivering, stuffed auricular reservoir behind an imperfectly diastolic and systolic ventricle, the *clinical* variety seems compatible with long and comfortable existence in some cases on the part of the patient, although, notwithstanding the intermittently powerful throb of his ventricle, he may not be regarded as an ideal investment by an insurance company, and rightly so regarded, in my opinion, in the case of most persistent arrhythmiæ. But between such auricular distensive impotence and the sudden failure of ventricular death in man there is as little in common as there is between such death and experimental ventricular fibrillation, which, though inevitably, is not instantly fatal.

To Dr. Mackenzie's conclusions in his second lecture less exception can be taken by "sinners" like myself, who have no immediate hope of salvation on Dr. Mackenzie's terms, and his emphasising the importance of dyspnœa as a sign of cardiac failure will be generally agreed to, as also his method of using digitalis in cardiac failure. But, surely, both the one and the other are commonplaces of medical opinion and practice. As regards the use of strychnine under these circumstances, I am not aware that it is regarded by anyone as a *direct* cardiac stimulant. I presume, however, that experience has justified its employment alone or as an adjunct both to digitalis and belladonna, by its action in improving the power of thoracic and abdominal respiration, the valuable aid given by which in assisting the circulation is indicated by the dyspnœa provoked by cardiac failure. The surgeon who has frequent opportunity of observing the cessation of respiratory movement precede cardiac stoppage is abundantly justified, in my opinion, in practising the hypodermic "ceremonial rite" of which Dr. Mackenzie expresses no unbounded admiration.

While thus I find myself asunder as the poles from the Oliver-Sharpey lecturer on many points, in other words, I fear, I must confess myself an unrepentant "sinner," I hope in good company, it is refreshing to meet with the lucid and bold expression of opinion, however little we may feel disposed to regard it as inspired, which characterises these lectures, which from their very emphasis are calculated to provoke fresh thought and discussion on so important a theme as cardiac failure.

I am, Sir, yours faithfully,

ALEXANDER MORISON.

Upper Berkeley-street, W., April 18th, 1911.

*To the Editor of* THE LANCET.

SIR,—Dr. James Mackenzie's interesting lectures remind us that not very long ago in heart disease our attention was chiefly concentrated on lesions of the valves, and a valvular murmur was the most looked for and significant sign of disease, while morbid conditions of the muscular structure and their manifestations did not receive the same amount of consideration. In a case where there was dilatation with a mitral murmur I think the conclusion would generally have been come to that the dilatation was the consequence of the valvular defect, but now we know the dilatation and the insufficiency of the valve may be the result of degeneration or want of tonicity of the muscular structure.

There are certain cases of dilatation due to muscular degeneration which seem to me to be almost deserving of being placed in a clinical group, for their symptoms present a great similarity. In a typical case of this kind the patient, a person probably in middle life, begins to complain of attacks of irregular heart action, with a pulse rapid, soft, and irregular in force and rhythm. In course of time these attacks become more frequent and prolonged, and there is some dyspnœa on exertion. Later on, when an attack occurs, the area of cardiac dulness is found to be increased, and on auscultation a cantering rhythm, *bruit de galop*, may be

heard, due to the reduplication of one of the sounds, and there may now be some albumin in the urine. As the disease progresses a systolic murmur at the apex becomes occasionally audible, the dull area increases in size, and symptoms of cardiac failure become noticeable during the exacerbations. But the patient may often greatly improve, the heart's action may become regular, and he may go on well for a time. When the disease is fully developed there is considerable enlargement of the heart, especially towards the left, and a systolic apex murmur is now constantly present, with irregular action and frequent *bruit de galop*. Albumin is probably always to be found in the urine, and there are often gastric disturbance and enlargement of the liver. When an exacerbation takes place at this stage there are often marked symptoms of heart failure, orthopnœa, œdema of the feet and legs, &c. But even then it is wonderful what rest and digitalis will do in some cases, and how often a patient who seems to be in a hopeless state will rally and regain, for a time, a fair amount of comfort and strength.

These cases generally run a course of a few years' duration. One patient who frequently comes under my care, and in whom the disease is fully developed, has been suffering from it for more than six years. From what I have seen I am inclined to think that recovery may take place in a case that comes under suitable treatment at an early stage of the disease. The end may be sudden, or it may come more gradually, with all the usual distressing symptoms of heart failure. Perhaps one of the weakest points of this grouping is that it is entirely clinical. The form of degeneration may not be the same in all the cases, but I have never had the opportunity of making an examination of the heart after death.

I am, Sir, yours faithfully.

Jersey, April 19th, 1911. ANDREW DUNLOP.

## THE WATER-SUPPLY OF CHERBOURG.

*To the Editor of* THE LANCET.

SIR,—My attention has been called to an article on the above subject which appeared in THE LANCET of March 25th, p. 841, under the heading "The Dangerous Water-supply of Cherbourg," in which an anonymous correspondent quotes from an article by a medical officer of the French navy, which would seem to have been written with a view to absolving the naval and military authorities from responsibility in connexion with the outbreak of typhoid fever which proved so disastrous to the garrison of Cherbourg in 1909. Many of your correspondent's statements are misleading, and I shall be glad if you will allow me to correct him on one or two points.

The strongly fortified arsenal occupies the whole of the north-west quarter of the town of Cherbourg, and with one exception all the naval and military barracks are situated within the fortifications. The naval hospital lies on the south side of the arsenal, and this and the whole of the barracks within the fortifications are supplied with water from the River Divette, the intake being at Octeville on the south side of Cherbourg. The civil Port of Cherbourg is supplied from the some river, but the intake is about a mile nearer to the town and *below* the intake for the arsenal supply. The isolated barracks of Val de Saire, situated in the centre of the town, are also supplied with water from the town mains. In the year 1898 the water of the river was supplied to the arsenal without filtration or other treatment, but it was clarified by passing through asbestos filters on the Maignen system before being supplied to the town. In October of that year an epidemic of typhoid fever broke out, and during 21 weeks resulted in the deaths of 63 soldiers and sailors out of a population of 8239, and of 25 civilians out of a population of 32,494. The garrison in the Val de Saire barracks suffered very severely during this epidemic, the origin of which was traced to the farms of La Prevaillerie, situated about half a mile above the intake to the arsenal supply.

After this epidemic the improvement of the water-supply was taken in hand, but some delay occurred owing to disagreements between the civil authorities and the medical officers of the arsenal. The adoption of the well-tried method of slow sand filtration had been proposed, and it is in this connexion that the text of the article from which your correspondent quotes may be found in a sentence in the third paragraph of the article which reads as follows: "The Director of the Naval Board pointed out that it was not filters only but a pure water-supply that was required." The civil authorities maintained with reason that an efficiently filtered supply was a pure water-supply, and they at once proceeded to adopt slow sand filtration, preceded by the treatment of the water antecedent to filtration by multiple filtration on the Puech-Chabal system. These filters were brought into use in 1907, while the naval and military authorities proceeded to carry out some experiments with various forms of household filters and with ozone sterilisation.

Your correspondent proceeds to state that "the source of supply remains as before, the army and navy sterilise some water for their men, and the town seems to purify its water in some degree by sedimentation and filtration. That is all that has been done." Precisely; but the results have been instructive. In 1909 another outbreak of typhoid occurred, the origin of which was traced as before to the farms of La Prevaillerie. In this case out of a garrison of 8578, 283 cases occurred, 55 of which were fatal. This during a period of 21 weeks. In this same period only one death from typhoid was recorded among the civil population of 36,422, while no single case of the disease occurred among the soldiers in the Val de Saire barracks, still supplied with water from the same source as that which supplied the arsenal and which is known to have been polluted, but from which the bacillus of typhoid had been entirely eliminated by slow sand filtration, that sure safeguard against water-borne diseases which has stood the test of 80 years and has never been proved to have failed except in cases of the grossest neglect. The system of multiple filtration, combined with slow sand filtration, which has proved so successful at Cherbourg, Paris, Antwerp, Magdeburg, and other large cities, has also been adopted at the large works of the Derwent Valley Water Board recently completed at Bamford, which comprise what is probably the largest filtration plant erected in this country in recent years, this in itself being a proof of the confidence which is felt by experienced engineers in this system of the protection of public water-supplies.

I am, Sir, yours faithfully,

WALTER CLEMENCE.

Farringford, Walton-on-Thames, April 19th, 1911.

## LAMARCKISM AND CALLOSITIES.

*To the Editor of* THE LANCET.

SIR,—Mr. S. G. Shattock at the meeting of the Royal Society of Medicine of Feb. 21st last read a paper on the above subject in which he displayed a method of research of great importance on the question of the transmissibility or non-transmissibility of acquired characters. At the same time, however, he showed that his view of Lamarckism—the usual view of most biologists—is not in accord with the writings of Lamarck himself. Let me explain. New characters—i.e., modifications of the body of the organism—are divided into two kinds—viz., (1) those appearing at birth, called *innate* characters; and (2) characters or modifications of the body which are brought about post-natally—such characters being either of kind or degree, or both. It is often lost sight of, however, that these latter, the acquired characters, are also divided into two kinds—viz., (1) those brought about *directly* and locally—e.g., the removal of a tail, callosities from local pressure, &c., and which are called *directly acquired characters;* and (2) those brought about through an effort on the part of an organism, as, e.g., the modifications produced by a change of habit in an organism or animal owing to an effort on its part to gain food, seek protection, &c. In the latter case the changes brought about in the organism are known as *indirectly acquired characters*, since the change is brought about, not directly on the parts of the body, but as the result of the change in habit. Now some Lamarckians claim that all acquired characters, however acquired, are transmissible, but they are in error, since Lamarck himself claimed that only characters which are *indirectly* acquired are transmitted, and modern science, I hold, supports that view.

In Professor Packard's "Life of Lamarck" (p. 294) we find the following statement by Lamarck which proves the truth of my contention: "Here it becomes necessary for me to explain the meaning I attach to the expression *circumstances influencing the form and structure of animals*....." "Assuredly, if these expressions be taken literally I should

be accused of an error, for whatever may be the circumstances they do not *directly* [italics mine] cause any modification in the structure of animals [Lamarck is here writing about permanent changes]. But the great change in circumstances brings about in animals great changes in their needs, and such changes in their needs necessarily cause changes in their actions. Now if the new needs become constant or very permanent the animals then assume new habits which are as durable as the needs which gave origin to them." The transmission through heredity of the changes in the body of the organism thus brought about indirectly through new habits is thus expressed in Lamarck's second law: "Everything which nature has caused individuals to acquire or lose by the influence of the circumstances to which their race may be for a long time exposed, and consequently by the influence of the predominant use of such an organ, or by that of the constant lack of use of such a part, it preserves by heredity and passes on to the new individuals which descend from it, provided that the changes thus acquired are common to both sexes, or to those which have given origin to these new individuals."

We thus learn that Lamarck recognised as being transmissible only those changes which are brought about in a race or species through modified or new actions, when those new or modified actions are really new habits taken on in order to satisfy their needs—e.g., the need of food, protection, &c. The new habits being common to all the individuals of the species subjected to the changes, are, as a result, transmitted from parent to offspring. As regards characters which are brought about *directly*—i.e., locally through accidents, mode of life, or otherwise—Lamarck expressly stated that they are not transmitted. On p. 319 of his life by Packard, Lamarck states: "We see that in man, who is exposed to so many diverse circumstances which exert an influence on him, the qualities or the accidental defects which he has been in the way of acquiring are thus *prevented from being preserved and propagated by generations*" (italics mine). He is evidently here remarking on the strength of racial characters. From a careful study of evolution from every standpoint, specially that of Lamarckism, for many years, I hold that not only was Lamarck right in his theory, but also that that theory is in accord with modern science.

Biologists, with few exceptions, have hitherto failed to understand Lamarck and to interpret him aright. This is due, I maintain, to the fact that in his time the nervous system and the part it plays in organic evolution was very imperfectly, if at all, understood, except to a certain extent by Lamarck himself, and to the fact that in the present day such an influence by the nervous system has been almost wholly overlooked by biologists, their attention being mainly taken up with cytology. In the present day, however, when medicine is becoming more and more a study of biology, and when that fuller knowledge possessed by scientifically trained physicians is brought to bear on heredity, organic envolution, and the questions arising therefrom, I feel assured we shall in a comparatively short time see the solution of questions which have hitherto baffled the pure biologists.

In order to understand Lamarck we must go back to his own writings. We cannot learn what is true Lamarckism from the writings of men who, however eminent, failed to understand him. So important is this subject that Herbert Spencer thus wrote: "A right answer to the question whether acquired characters are or are not inherited underlies right beliefs not only in biology and psychology, but also in education, ethics, and politics."

I am, Sir, yours faithfully,

R. F. LICORISH, M.D.

Bridgetown, Barbados, W.I., April 3rd, 1911.

## THE "DR. COOKE FUND."

*To the Editor of* THE LANCET.

SIR,—Will you allow me through your columns to express on behalf of the committee my warmest thanks to the medical profession for the magnificent response which they have made to our appeal, and my real regret that, by reason of the overwhelming number of sympathetic letters, it has been impossible at present to reply individually in each case as was wished and is intended?

To all donors I believe a banker's formal acknowledgment has been sent, but this shall be supplemented at the earliest moment; meanwhile I would ask the indulgence of the many most generous contributors to whom I and those associated with me are more grateful than we can express.

I am, Sir, yours faithfully,

Barnstaple, April 21st, 1911. JOHN R. HARPER, Treasurer.

## THE TOXICOLOGY OF FILIX MAS.

*To the Editor of* THE LANCET.

SIR,—An annotation under the above heading occurs in THE LANCET of April 22nd, p. 1094. I venture to suggest that the toxic effects of the extract of filix mas were due to the fact that it was taken along with castor oil. In my opinion this favours the absorption of the extract, as it certainly does that of santonine. Neither of these drugs is given with the intention of their being absorbed. I have known convulsions to be produced in children when castor oil was used as the after-purgative, and I maintain that the toxic symptoms described in text-books as caused by santonine are only produced when castor oil is given subsequently. I have never once seen a case of poisoning result when calomel or some purgative other than castor oil was used along with santonine or filix mas, even when the latter happened to be given in large doses.

I have always made it a habit to point out to students that there are grave risks entailed in prescribing castor oil along with filix mas or santonine, but conversations with practitioners lead me to believe that this opinion is not by any means generally held. I think the case you cite seems to support my view, and I trust that the publicity you have given to it will serve as a note of warning to the profession when prescribing either filix mas or santonine as a vermifuge.

I am, Sir, yours faithfully,

Edinburgh, April 22nd, 1911. JAMES BURNET.

## THE SOUTH AFRICAN CIVIL SURGEONS' DINNER.

*To the Editor of* THE LANCET.

SIR,—The seventh of these dinners, now held every third year, is fixed for Thursday, June 1st, at the Imperial Restaurant, Regent-street, at 7.45. Mr. G. L. Cheatle, C.B., will take the chair, and Field Marshal Lord Kitchener has accepted an invitation to be the principal guest. We hope a special effort will be made by all who served as civil surgeons and dressers in the South African war to attend and give a warm welcome to our former Commander-in-Chief.

Notices will be issued by the end of the month to all on our list. We hope those who do not receive any communication will write and inform us of the fact.

We are, Sir, yours faithfully,

C. GORDON WATSON,
F. E. FREMANTLE, } Hon. Secs.

123, Harley-street, W.

## THE MOSQUITO PLANT.

*To the Editor of* THE LANCET.

SIR,—As from your note at p. 1095 of your issue of April 22nd there seems a lack of evidence as to actual trial of the mosquito plant, I may contribute results obtained by me. When attention was first drawn to the ocymum viride by Major Larymore the Horticultural Society of Madras promptly imported specimens, of the genuineness of which there could be no doubt. I obtained some for trial. The fact that the Hindus regard the *thulasi* (Ocymum sanctum) with veneration, and as a desirable adjunct to each house, gave zest to the observation. I found that mosquitos availed themselves of the plants as convenient resting places—but otherwise ignored their presence.

I am, Sir, yours faithfully,

W. G. KING, Colonel, I.M.S. (retired).

Ufculme, N. Devon, April 25th, 1911.

## CULTURE TESTS FOR THE PLAGUE BACILLUS.

*To the Editor of* THE LANCET.

SIR,—In having to distinguish this month certain bacilli from the bacillus pestis I have put through the sugars a culture from a case of the recent Harbin epidemic of pneumonic and septicæmic plague. Through the same sugars I have put, too, a culture of bacillus pestis I had some two years ago from Dr. A. Stanley of Shanghai that has been kept active by the passage through mice. The results agree with those given in the Indian Plague Commission reports. You may possibly consider this fact worth recording. Glucose, acid formation in less than 24 hours; maltose, acid formation in less than 24 hours; levulose, acid formation in less than 24 hours; dextrose, acid formation in 24 hours; mannite, acid formation in 24 hours; galactose, acid formation in less than 48 hours; dextrin and salicin, acid formation in less than 48 hours. With lactose, saccharose, and inulin there was no acid formation. In no case was there prodution of gas. There was no change of colour in neutral red broth. I am, Sir, yours faithfully,

J. G. GIBB, M.D. Durh., F.R.C.S. Eng.

Peking, March 31st, 1911.

## A CORRECTION.

*To the Editor of* THE LANCET.

SIR,—In the report of the Leeds and West Riding Medico-Chirurgical Society published in THE LANCET on April 22nd, p. 1078, there is a slight mistake in the record of my case of cancer of the common bile-duct. The words "the lower end of the cystic duct was ligatured" should read "the lower end of the common bile-duct was ligatured."

I am, Sir, yours faithfully,

Leeds, April 22nd, 1911. H. LITTLEWOOD.

## LIVERPOOL.

(FROM OUR OWN CORRESPONDENT.)

*Yellow Fever in West Africa: Sir Rubert Boyce's Mission.*

Sir Rubert Boyce, the professor of pathology at the University of Liverpool, who recently went to West Africa on a mission to investigate yellow fever there, has issued a report to the Colonial Office giving comprehensive details of his investigations. A little consideration, he says, will show that with the progress of civilisation and luxury on the Coast the conditions of mosquito-breeding have very materially altered. He advocates more house-to-house inspection on the part of all the local sanitary authorities, and urges the necessity for pipe-borne water-supplies and the enforcement of bush-clearing regulations. He considers that there is not sufficient practical training given in tropical schools, and says that far more attention should be paid to the scientific education of young medical officers than at present, while he suggests that the mining companies should be induced to select only medical officers holding diplomas of the tropical schools and a diploma in public health. The time has come, he says, to frame a suitable British intercolonial quarantine measure, to extend it or bring about an international quarantine measure on the lines of the pan-American one.

*The School of Hygiene of the University of Liverpool.*

The Liverpool School of Hygiene has arranged for a course of six lectures on milk-supply. These will deal with the composition of milk; the sanitation of cowsheds; the diseases which may be conveyed by milk; and legislation affecting the production and sale of milk. The series of lectures commenced on Thursday, April 20th, at the Ashton Hall in the University, and will be continued each following Thursday. The addresses are calculated to be of exceptional interest and benefit to the community.

*Runcorn Cottage Hospital.*

Mr. F. J. Norman of Runcorn has presented a new wing to the Runcorn Cottage Hospital, together with a block of six "citizens' homes" for aged poor cripples. Each house has been prettily furnished in oak. The gifts are unconditional, and the homes may be occupied at a rental of 6*d.* per week by poor people of any creed. The expenditure on the buildings amounts to £2000. The wing and "homes," which have been recently opened without formal ceremony, are dedicated to the memory of the late Mr. Thomas Norman, the father of the generous donor.

April 25th.

## SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

*Scottish Vital Statistics.*

THE annual report to the Registrar-General on Scottish vital statistics for 1910 has just been issued, along with the report on vaccination for 1909. The reports, which are signed by Dr. J. Craufurd Dunlop, are, as usual, of considerable interest. Among the outstanding facts therein recorded are the lowness of the birth- and death-rates, the drop in the deaths from tuberculous disease, the number of deaths from malignant disease, and the very considerable increase in the proportion of unvaccinated children. The report points out that as it was nearly ten years since the last Census of Scotland was taken, errors in estimating population are likely to be considerable, and that therefore the estimates are given with reserve. The estimated population of Scotland in the middle of 1910 is 4,929,251, and of these 46·5 per cent. live in the principal town registration districts. The birth-rate for the year is 25·16 per 1000, being the lowest Scottish annual birth-rate yet recorded. The rate is 1·20 less than in 1909 and 2·16 less than the average rate of the preceding five years. From 1855 to 1893 the national birth-rate varied between 30 and 35·6 per 1000. Of the children born during the year 6·85 per cent. were illegitimate. The illegitimate rate was highest in the mainland rural districts. The death-rate was 14·66 per 1000 of the estimated population and the lowest Scottish death-rate yet recorded. The infantile mortality rate amounted to 122 per 1000 births. With regard to deaths from infectious diseases, it is shown that in the eight principal towns there was no serious epidemic, with the exception of an outbreak of measles. Cerebro-spinal meningitis, which appeared in Scotland in epidemic form in 1906 and which caused 1018 deaths in the eight principal towns in 1907, showed in 1910 only 39 deaths. Deaths from tuberculous disease numbered 3458, as against 3763 in 1909 and 3882 in 1908. On examining the death-rate from tuberculosis in the eight principal towns, there is found to be, since 1901, a decline of 30·3 per cent. in the death-rate from all tuberculous disease, while the decline in the phthisis rate is one of 35·2 per cent. The decline in the tuberculosis death-rate of the towns is most marked in Edinburgh. Deaths from malignant disease numbered 2017, as compared with 2031 in 1909 and 2151 in 1908. The weather conditions showed a normal mean temperature and a somewhat high average rainfall. Among the vaccination statistics, those are of most interest which deal with the evasion of vaccination. As was expected, there was again a large increase in the number of persons availing themselves of the opportunity for evasion provided by the 1906 Vaccination (Scotland) Act. The number of persons signing the conscientious objections clause in 1909 was 22,746, as against 15,846 in 1908, 7258 in 1907, and 253 in 1906, the year of the passing of the Act. It is estimated that the Act must be held responsible for adding to the population 25,000 unvaccinated children in 1909, or a total of 45,000 in the course of 1908 and 1909. The figures for 1910 do not become available until 1912. As has been pointed out before, the Act above mentioned does not require of the parent any declaration of conscientious objections to vaccination in general, but merely a statement that in his opinion vaccination would be prejudicial to the health of the particular child named.

April 24th.

THE BOSTOCK SCHOLARSHIP.—An examination for this scholarship, of the value of £60 a year, and tenable for two or four years at the London (Royal Free Hospital) School of Medicine for Women, will be held by the University of London on June 5th. Particulars may be obtained on application to the secretary of the school, 8, Hunter-street, W.C.

## VIENNA.

(FROM OUR OWN CORRESPONDENT.)

*New Professors appointed to the Clinics for Medicine and Pædiatrics.*

THE two vacancies in the Vienna clinics have now been filled, and a new third clinic has been created, much to the satisfaction of the medical profession here. The most important appointment is that of Professor Ortner, who has taken over the clinic which was lately under the control of Professor von Strümpell, and before him under that of Professor von Schrötter. At the same time, Professor Chvostek has been appointed ordinary professor of clinical medicine, so that we have now four medical clinics, the respective teachers being Professor von Neusser, who works chiefly on the subjects of the blood and the circulation; Professor von Noorden, who principally occupies himself with the problems of metabolism; Professor Ortner, who will deal chiefly with the methods of physical examination; and Professor Chvostek, who will make a feature of the diseases of the nervous system in his clinic to be opened in the autumn. Professor von Pirquet has been appointed chief of the clinic for diseases of children, succeeding Professor Escherich, whose pupil he formerly was. Several additional institutes are now required—namely, a second physiological, a second chemical, a second pathological, and a second experimental institute, so that a number of professors, *privat-docenten*, and assistants will be necessary for them, but it remains to be seen whether the Government is prepared to deal with the financial side of the question.

*Observations on the Functions of the Cerebellum.*

At a recent meeting of the Gesellschaft der Aerzte Dr. Barany reported the results of observations which he had made on patients whose cerebellum was fairly accessible to the effects of cold, being covered only by dura mater and skin in a certain part. He said that the phenomena in question were most readily presented by patients who had undergone operation for cerebellar abscess, and that it was a suggestion by Dr. Trendelenburg which led to the inquiry. On applying at first cold water and afterwards a spray of ethyl chloride to the scar covering the cerebellum Dr. Barany found that there was no perceptible effect unless the application lasted for some time, with at least from two to three minutes of intense cold. Under these circumstances a certain patient showed during the action of the low temperature a loss of orientation in his arm in such a way that the arm of the side on which the cold application was made to the cerebellum missed a certain point which he was asked to touch and which he could touch before the application of the cold. In some other cases the application of cold to the cerebellum had the effect of producing an artificial nystagmus and thus confusing the spheric orientation of the patient. Dr. Barany explained these facts by the assumption that the cerebellum contained centres for the movement of the upper extremity towards the left side and towards the right side respectively, and that the cold application temporarily paralysed one of these centres. No ill-effects of any description followed these local applications of cold to the cerebellum.

*Operations for the Relief of Compression Myelitis in Tuberculous Spondylitis.*

Dr. Bakes, in response to an invitation received from the Medical Society of Brünn, gave at one of the meetings a description of his treatment of diseases of the vertebral canal, and showed two patients on whom he had successfully operated for the relief of tuberculous affections interfering with the function of the spinal column. One patient, a youth 18 years of age, presented all the symptoms of compression, and, moreover, suffered from angular curvature; on the removal of five vertebral arches the spinal canal was found to be filled by soft tuberculous granulations encircling the cord. When the granulations were carefully scraped away a normal dura mater appeared, and a prolonged search, which required cautious handling of the cord, revealed the presence of the tuberculous centre in the body of the adjoining vertebra; this was accordingly removed. Although the tuberculous lesions were extensive, the dura mater was normal, as already mentioned, and an exploratory incision made in it showed that the spinal cord was intact. The opening was then carefully closed, and the patient made an excellent recovery. Another case was that of a woman, aged 30 years, who was completely paralysed below the seventh dorsal vertebra. Dr. Bakes having removed six dorsal arches found on the anterior aspect of the dura mater a large tuberculoma which had compressed the nervous tissue; he also discovered two large paravertebral abscesses. All the diseased tissue was removed, and the cavities were filled with Beck's paste of bismuth, but the patient suddenly died 10 days later. Post-mortem examination showed that death was due to pulmonary embolism, the operation wound being in an excellent condition. As the result of his experience he recommended that all cases of compression of the spinal cord should be operated on as soon as the diagnosis was established.

April 24th.

## PARIS.

(FROM OUR OWN CORRESPONDENT.)

*Numerical Limitation of Doctors.*

FRENCH doctors are lamenting the overcrowding of their profession. It is a general complaint in all countries where advanced culture prevails, and the development of classical and literary studies, appearing an undisputed sign of intellectual aristocracy, increases disproportionately the number of those desirous of deriving their means of existence from the culture to which they have attained. France is in this respect as heavily burdened as England, Germany, or Austria. Naturally doctors seek among themselves some remedy for this state of things, but of those hitherto successively proposed all are equally inacceptable and inefficacious. One which comes up most frequently in their discussions is a limitation of the number of doctors. To many this operation would effect the magic result of limiting competition and enable each doctor (whose appointment would be based on the number of inhabitants of each town or district) to earn his bread honourably. The medical syndicates and the Congrès des Praticiens have decided to immediately study this measure, which is strongly advocated. Without wishing to engage in a one-sided discussion here or plead the case, this measure seems undesirable. In the event of its application the State must necessarily intervene in the designation of doctors for each locality. It would be with a vacant medical post as it is with other administrative functionaries of all sorts and degrees. To judge by the rule which guides the choice of these last, it is easy to foresee that doctors would lose all their independence, for political influences, so strong in all parts of France, would infallibly have the effect of nominating candidates favoured by the administration to the best appointments. The doctor, as an administrative functionary, would, like all other Government employees, be the slave of influential personages and of petty village tyrants, possessing the power of dismissing him. Another proposal which at first sight seems more liberal presents on closer inspection an insurmountable practical difficulty. It is that of limiting the number of diplomas granted to medical doctors each year, while leaving them free to take up practice where they may desire. But the present difficulty is not merely general overcrowding, it is an accumulation in certain localities, whereas in others medical service is insufficient; in short, the distribution of doctors over the territory is at fault. If it should be decided to give the medical diploma only to a number equivalent to the deaths in the profession during the preceding year, so as to fill up the blanks, the remedy is a doubtful one, for though the intention may be to supply a vacancy in the department of the Rhône, there is no obstacle to the new doctor, if he should so prefer, settling, say, in the department of the Nord, where family ties may draw him, and pressure to oblige him against his will to go to the Department of the Rhône would be a serious infringement of professional liberty. But there is another aspect of the case. Seven faculties exist in France. It is not possible to fix the number of degrees to be given in each in a fair and equitable manner, for whatever figure may be adopted dissatisfaction will prevail, and each in comparison with the other will detect a personal slight and a check to its development. So it seems that this Utopia may be abandoned and that we

must content ourselves, as was observed at the last Congrès des Praticiens, with a certain diminution in the number of degrees given in all the faculties as may be effected by inviting the professors to show more severity in the examinations, especially the earlier ones, while there is yet time for a young man to direct his attention to some other career. But not even this remedy is perfect, for if the Faculty of Paris, which is by far the most important, adopted this measure the provincial faculties, seeing an opportunity of increasing their students, would carefully eschew the example.

April 24th.

## CONSTANTINOPLE.

(FROM OUR OWN CORRESPONDENT.)

*A Useful Reform.*

THE new Minister for Public Instruction, Hakki Bey, has introduced a very useful reform into the administration of the Constantinople Medical Faculty. Up to the present the management of the purely business affairs of this institution was always carried on by a committee composed of a few of the professors from the staff of the faculty. Hakki Bey thinks that this mode of administration was not expedient, and has entrusted the management to a special director, who will have nothing to do with teaching, but will attend to the purely business affairs. All the professors, on the other hand, will henceforward devote their whole time to scientific questions of a medical interest and to the instruction of the students. I understand, however, that some among them are dissatisfied with this reform and that the Minister for Public Instruction is beginning to find that to introduce innovations into antiquated systems sanctioned by tradition and custom is not at all an easy matter. He will also find that his request for the necessary means to create a proper building in Stamboul, whereto the medical faculty could be transferred from Haidar Pasha, will not be answered soon, if at all. The Turks seem to have very little money for matters of education. Then, quite a large proportion of Osmanlis think that the medical faculty is perfectly well situated where it is at present, and that its transfer to Stamboul would be only a waste of money.

*Taxes from Medical Men.*

Up to the present the medical men in the Ottoman Empire have always been exempt from any payment whatever to the State revenue. It is true that at one time the Turkish Government made an attempt to force medical men to use special stamps, which were to be affixed on each medical prescription given to a patient, but this attempt was not crowned with success. The Ottoman Government, desirous of increasing its revenue by every possible means, is contemplating at present the levying of taxes from physicians for the right to practise. A most energetic protest is being made against this "reform." It is to be hoped that it will never be carried through as long as the status of the Turkish medical men remains on such a low level, from a social and economic point of view, as it is now. The preponderant majority of them are leading a very poor existence indeed, and taxes of any kind would make their lives altogether miserable. Thus the municipal medical men are allowed a salary amounting only to 500 piastres (£1 = 120 piastres) per month. The medical graduates of this year have written to the Grand Vizier protesting against such small allowances. It is said that he is taking the necessary steps to improve this state of affairs.

*Sanitary Conditions in the Yemen.*

Details about the Yemen and the insurrection there are coming out. From March to the end of October the tropical heat sets in, and will be unbearable to the Turkish troops fighting the Arabs. Plague and cholera cases are sure to occur—first singly and isolated, and afterwards with ever-increasing intensity. This, at least, has always been the experience of former military expeditions to the Yemen. The greatest scourge, however, is dysentery, which produces enormous ravages among the soldiers. Ice is to be got only at Hodeida, where a Turkish pasha instituted an ice factory. In no other place of the vast province is one to be found, so that medical men lack one of the most valuable means for attacking disease in tropical regions. Drinking water almost everywhere is bad, and so is the clothing of the Turkish soldiers. Whereas the Arab warrior is lightly dressed, sometimes and in some places almost naked, the Turkish soldier wears clothes and carries ammunition too heavy and cumbersome for the Yemen. The hardened foot of the Arab does not feel the intense heat of the stirrup, whereas the Turkish cavalryman could not possibly bear the touch of the latter and has to protect his foot in a special manner. All these drawbacks are retarding considerably the progress of the Ottoman army. In the Turkish quarters, however, the spirit of optimism continues to prevail, and firm confidence is expressed that the insurrectionary movement of the Arabs will soon be completely quelled. This was the view expressed to me by a very high Ottoman statesman.

*A Pathological Ward for the Greek Hospital.*

The rich Greek family, Mavrogordato, have given to the Greek Patriarchate the sum of £120,000 for the purpose of building a pathological ward in connexion with the Greek Hospital at Yedi-Koule (the Quarter of Seven Towers).

April 20th.

## CANADA.

(FROM OUR OWN CORRESPONDENT.)

*Typhoid Fever and Small-pox in the Capital.*

DURING the past two or three months Ottawa, the capital of the Dominion, has been going through an epidemic of typhoid fever. There have been over 1000 cases of the disease. So acute did the situation become that the medical health officer's resignation was called for, and the services of the Ontario Board of Health and those of Dr. C. A. Hodgetts, medical health officer to the Conservation Commission, were pressed into requisition. At the present writing Dr. Hodgetts is in charge of the situation and the Board of Control is advertising for a health officer. Added to this small-pox broke out to the extent of 25 cases or more. The House of Commons while in session has frequently debated the position of the capital's health affairs, one member going so far as to move that the House prorogue as the state of health matters in Ottawa was inimical not only to the Members of Parliament themselves but to their families and the large body of Canadian citizens brought into the city by reason of the assembling of Parliament. There has been some discussion about placing Ottawa under the direct control of the Government, as is the case with Washington and the District of Columbia.

*The Dominion Laboratories at the Capital.*

A great deal of scientific work is being carried on in the Federal Government laboratories at Ottawa. Considerable work had been done in the subject of bacteriology until Mr. Lehman departed to accept an appointment under the Government of Burma. Recently one of the buildings of the Department of Inland Revenue was destroyed by fire and in the construction of a new building the needs of bacteriology will be met. This will be put in charge of Mr. Aimé Valin, who for many years has been connected with the Department of Chemistry. There is need for much consolidation in the medical services of the Government at Ottawa. For instance, four laboratories in four separate departments may undertake water analysis. There are four laboratories dealing with food problems. It can thus be easily conceived that a great deal of overlapping must result, and that a consolidation of the various services under a responsible head is urgently needed.

*Alexandra Hospital, Montreal.*

The annual meeting of the board of governors was held recently in Montreal, when the report showed that 820 patients had been treated in this institution during the past year. This was an increase of 165 over the numbers of the previous year. The total number of deaths was 47, which constitutes the lowest death-rate since the hospital was opened. This hospital is for the English-speaking people and for infectious diseases. Of diseases treated there were 233 scarlet fever cases, 227 diphtheria, and 210 measles. Dr. T. G. Roddick was elected president of the institution.

*Montreal General Hospital.*

The year 1910 was the biggest year in the history of the Montreal General Hospital. There were treated to a

conclusion in the hospital 3586 patients, an increase of 284 over the previous year. There were 272 deaths. The average number of patients in the hospital per diem was 205. The average number of days in the hospital per patient was 20·8. In the outdoor departments the total number treated was 13,588, while the total number of consultations reached 59,683. During the year 18 nurses completed their training at the institution.

*Annual Meeting of the Canadian Medical Association.*

The forty-fourth annual meeting of the Canadian Medical Association will be held in Montreal on June 7th, 8th, and 9th, under the presidency of Dr. George E. Armstrong, Dr. E. W. Archibald, of 160, Metcalfe-street, Montreal, being general secretary. This meeting will follow immediately upon the official opening of the new McGill Medical Buildings, Convocation, and the McGill reunion. A very fine programme is being prepared, and intending visitors from Great Britain who will present papers should so advise the chairman of the programme committee, Dr. H. S. Birkett, 252, Mountain-street, Montreal. The annual post-graduate medical course for 1911 of McGill University begins on Monday, June 12th, and will be continued for a period of six weeks.

*Royal Commission on Tuberculosis Reports.*

The Royal Commission on Tuberculosis of the province of Quebec has finished its work and reported to the Government. Amongst the prominent medical men on this Commission were Dr. J. George Adami, Dr. E. P. Lachapelle, Dr. Michael J. Ahern, Dr. J. E. Dube, Dr. J. J. Guerin, and Dr. T. G. Roddick. The document gives very explicit and definite recommendations. The measures recommended for immediate action are as follows:—1. More rigorous applications of laws contained in the statutes regarding tuberculosis. 2. Elementary instruction on hygiene in the primary schools, normal schools, and other houses of education. 3. Popular instruction under the direction of the Board of Health. 4. Medical inspection of schools, shops, and factories. 5. The establishment and maintenance of anti-tuberculosis dispensaries in the principal centres in the province. 6. Isolation of advanced cases amongst the poor. 7. Establishment of open-air schools for weak children who are prone to tuberculosis. 8. Treatment of the curable cases by the "class" method, as it has been demonstrated that this is a method of treatment almost equal in results to sanatoriums and much more economical, giving to the patients besides the opportunity of living with their family. This kind of treatment is acceptable to the poor people, and the sanatorium method to people of a richer class. 9. Legislation to prohibit the premature employment of children. 10. Investigation and legislation regarding the hours of labour of adults in factories. 11. Legislation against alcoholism. 12. Meat inspection and the control of the sale of milk. The measures for gradual execution are: (1) the establishment of preventoriums; (2) the erection of sanatoriums; (3) agricultural and vacation schools; (4) improved condition of dwelling houses and legislation to insist upon the construction of sanitary dwellings at reasonable rent for the working classes; and (5) legislation for improved hygienic conditions in the cities and districts of the province.

*The New Toronto General Hospital.*

The foundation-stone of the new Toronto General Hospital was laid on April 11th by His Excellency Earl Grey, the Governor-General. The site upon which the new hospital will stand comprises a little over 10 acres and was formerly occupied by some 200 houses; it cost £120,000. Buildings to the value of £280,000 were already under contract, and further contracts still to be let would bring the building expenses up to £400,000, making with the site a total of £520,000. Towards this sum the University of Toronto contributed £120,000, the city of Toronto £80,000, and private citizens £200,000. President Falconer of the University of Toronto at the function of the laying of the stone emphasised the interrelations of science and philanthropy which the connexion between the hospital and the University would facilitate. The University would bring to the aid of suffering all the resources of knowledge, while the clinical facilities that the medical department would offer to the University would in turn benefit the domain of science. The mayor regarded it as most significant that Toronto, hitherto a laggard, had at last taken her proper place in the van as regarded care of the sick and injured. Lord Grey then laid the corner-stone, and delivered a brief address in a happy vein. The new hospital will consist of a long block of buildings fronting on the College, and containing wards, with the administration buildings in the centre and an emergency building at one end. The out-patient department, the wards for private and semi-private patients, the nurses' home, Burnside Building for obstetrical cases, servants' quarters, central pathological building, and central power-house will constitute a group of separate buildings in the rear of the main building and grouped so as to form a symmetrical and harmonious whole. The pathological building, contributed by the University, besides serving the hospital requirements, will afford splendid teaching facilities.

*News Items.*

Dr. J. N. Elliott Brown has resigned from the position of superintendent of the Toronto General Hospital and will proceed to Europe to study hospital construction and administration. Dr. Fred. J. Tees has retired from the superintendency of the Montreal General Hospital and has been succeeded by Dr. G. Shanks. Dr. E. G. Kidd has been appointed to succeed Dr. Etherington as head of the anatomical department of Queen's University, Kingston, Ontario. Dr. Vrooman, Winnipeg, Man., has been appointed superintendent of the Tuberculosis Hospital at Tranquille, in British Columbia.

April 15th.

## UNITED STATES OF AMERICA.

(FROM OUR OWN CORRESPONDENTS.)

*Enlargement of the New York Academy of Medicine.*

IT has been decided to erect an entirely new building to house the New York Academy of Medicine, covering the present area and two adjoining city lots recently purchased, which will add at least 4000 sq. ft. to the foundation. The building will be eight or ten storeys in height and will probably contain 1,000,000 cub. ft., as over 600,000 cub. ft. are required as a minimum to contain the proposed improvements. A hall to hold 1000 persons, exclusive of galleries, is wanted, a stack room to hold 300,000 volumes, and a reading-room at least double the present size. £17,000 have already been subscribed by 169 persons, two non-members promising £100 each. The public will not be appealed to until the membership has been thoroughly canvassed.

*Instruction in Hygiene in the Public Schools.*

The Director of Physical Training of the New York Board of Education has recommended that, in addition to the measures for the health of the children now carried out in the school buildings, each child shall be furnished with a printed list of rules for its conduct at home and at play after school hours. These proposed lists contain minute instruction concerning bodily hygiene and also concerning the care of the child's room, clothing, books, &c., as well as a recommendation as to the proper division of hours to be devoted to study, sleep, and recreation.

*A Cold Storage Bill for New York State.*

The Assembly has adopted a Bill making it unlawful for any person or corporation to place articles of food in cold storage unless the food or the package containing it is branded, stamped, or marked with the exact date when the same is received, or to keep such articles stored for a longer period than six months. Transfer of articles from one cold-storage house to another is prohibited. Full provision is made for regular inspection and for the quarterly submission of reports.

*The Common Drinking Cup in New York.*

The Board of Health of New York has added an additional section to the Sanitary Code which will make it unlawful after Oct. 1st to have what is known as a "common drinking cup" in any public building, institution, factory, theatre, school, railway station, or ferry-house in the city.

*Fire in a Hospital.*

A fire broke out on April 6th in the laundry building of the Philadelphia Hospital which for a time threatened to destroy the institution. 200 patients were carried out of the tuberculosis pavilion through the dense smoke, and the medical men and nurses had great difficulty in quelling the panic in

the general wards of the hospital, as the patients therein were almost unmanageable from fear. The loss by the fire is estimated at $285,000 (£57,000).

*Bequest of the late Dr. Henry P. Bowditch to Harvard.*

Dr. Henry P. Bowditch, who died recently, left by his will to Harvard Medical School $4000 (£800) and all his books and scientific apparatus. The money is to be added to the fund left by his father, the income of which is to be "expended under the direction of the professor of physics for the purpose of original investigation."

*The Canteen of the United States Army.*

The abolition of the army canteen has proved to be an error of judgment from many points of view. The report has been current recently that the Women's Christian Temperance Union, the members of which were responsible for the abolition of the army canteen in the United States, will withdraw its opposition. It is said that the mobilisation of the troops in Texas has afforded further proof of the lack of wisdom shown in abolishing the canteen. The neighbourhood of the American army camp at San Antonio is full of drinking dens of the worst kind, over which, of course, the military authorities have no jurisdiction. The anti-canteen law makes impossible the maintenance of clean and well-conducted canteens in which only the milder form of beverage would be sold. The conditions, as regards drinking among the soldiers, are said to be so bad that special reports on the matter are expected from the commanding officers.

*The Pure Food Law in Pennsylvania.*

A Bill has been introduced into the Pennsylvania Legislature with the view of overthrowing the pure food laws of the State by permitting the use of sulphur dioxide in the manufacture of candy.

*Meeting of the National Association for the Study of Epilepsy.*

The American National Association for the Study of Epilepsy and its Care and Treatment will hold its annual meeting in St. Louis on June 16th, under the auspices of the St. Louis Medical Society.

*Hypodermic Needles and Medical Drug Users.*

It is averred that a Massachusetts toxicologist recently stated in a public lecture that over 10 per cent. of the physicians of the United States were drug users. Foreign readers of such statements should remember that proper legislation regarding the practice of medicine is comparatively recent in this country, which is still afflicted with thousands of practitioners without college or hospital training; also that all persons with a degree are included, although many thousands of graduates are engaged in other work—on the newspapers, the stage, and in business of various kinds—where the use of a drug imperils no one but themselves. In New York State a Bill has been introduced to prevent the sale of hypodermic syringes to unauthorised persons. It would seem that enforcement of the law against the sale of narcotic drugs should suffice, for hypodermic syringes are used for many purposes, by entomologists, for example, and other naturalists.

*Medical Care of the Army along the Mexican Border.*

The 25,000 troops massed along the Rio Grande have all been vaccinated with the antityphoid serum; a simple but carefully tested system of disposal of waste has been put into operation; cleanliness of the camps has been secured by the establishment of squads of hospital corps men under medical supervision; trained sanitary inspectors and field laboratories are, at last, part of the divisional organisation; and behind all is the reorganised Red Cross with its enrolled trained nurses. It is said that ten times the number of troops could have been provided for with equal efficiency, so admirable was the preliminary organisation.

April 14th.

LONDON (ROYAL FREE HOSPITAL) SCHOOL OF MEDICINE FOR WOMEN.—The prizes and certificates will be presented to the successful students of the London (Royal Free Hospital) School of Medicine for Women by Lady Minto, on Wednesday, June 14th, at 4 P.M. Mrs. Garrett Anderson, M.D., will preside. Mr. F. D. Acland, M.P., has joined the council of the school, and Mrs. Bryant, D.Sc., Miss A. C. Freeman, and Mr. G. P. Mudge have become members of the school committee.

# Obituary.

## HENRY SIMPSON, M.D. LOND., M.R.C.S. ENG., L.S.A.,

CONSULTING PHYSICIAN TO THE MANCHESTER ROYAL INFIRMARY, ETC.

WITH much regret we record the death of Dr. Henry Simpson, for many years a valued correspondent and contributor to THE LANCET. He was born at Lymm in Cheshire in the year 1829, his father being a property owner in the neighbourhood of Wilmslow, but the family originally came from the Border and were adherents of the Stewart Pretender. The early years of Dr. Simpson were passed at Chester, to which city his parents had removed. After receiving some preliminary education in that town he was sent to school at Sheffield and his medical education was begun under Dr. Waddy at Birmingham. In 1848 he entered at University College, London, and three years later qualified as M.R.C.S., and filled the junior resident posts at University College Hospital. In 1852 he became a Licentiate of the Society of Apothecaries of London and returned to his native place, where he commenced to practise, and where he remained till 1864. While at Lymm he graduated as M.B. of London in 1859, taking the M.D. degree in 1861. These were the less exacting days when the country practitioner, if not using his horse for his professional duties, could ride to hounds. Dr. Simpson was an enthusiastic horseman, and his practice among the Cheshire farmers, by whom he was much liked, gave him many opportunities of exercising his favourite bent.

About the year 1864 he took up practice in Manchester and became associated with several of the Manchester institutions, and notably with the infirmary, where he was on the honorary staff for many years. At the time of his death he was consulting physician to the Manchester Royal Infirmary, to the Manchester Hospital for Consumption and Diseases of the Throat, to the South Manchester Hospital for Diseases of Women and Children, and to the Manchester Ear Hospital. He was an ex-chairman of the Manchester and Salford Sanitary Association, and the inaugural address on Sanitary Progress and Reform which he delivered when the association held its annual congress at Manchester in 1895[1] shows how firm a grasp he had of the conditions which are necessary for the promotion of health and of the means by which those conditions may be fostered—namely, by a right method of instructing school children, helping them to practise the simple laws of health individually, and leading them on to see and to feel the duty as to matters of health which they owe to the community at large. He was also ex-chairman of the local Medical Guild and ex-president of the Manchester Medical and Clinical Societies.

With the giving up of country practice his opportunities for indulging in his favourite pastime of riding ceased, but fishing became his chief hobby. As a member of the Manchester Anglers' Association he was well known. During the greater part of the time that he lived in Manchester his private house was near Bowdon, a house which had a beautiful garden of considerable size, and here he was able to enjoy to the full another of his hobbies, horticulture, devoting much attention to the growing of auriculas and other flowers. When physical infirmity from sciatica and rheumatism made work increasingly difficult he retired to Conway, and later to Deganwy in North Wales, where he died on April 13th. He became deeply interested in Conway Church, of which he was a churchwarden, as he had been some years previously of Bowdon Church where he sang in the choir. Being of an energetic temperament, even when infirmity prevented him from taking part in sport which required much activity he still continued to make the most out of life, and for trout fishing he substituted sea fishing from a boat, and when walking became impracticable enjoyed the delights of his garden from a bath chair. Dr. Simpson married in 1853, while at Lymm, Mary, the second daughter of Henry Hardey of Heatley. By her he had 12 children, of whom two died in infancy and another when a schoolboy. The other nine are still living. Mrs. Simpson died a year ago.

[1] Vide THE LANCET, May 4th, 1895, p. 1097.

### ARTHUR JAMES MACDONALD BENTLEY, M.D., C.M. EDIN., M.R.C.S. ENG.

THE death occurred on April 19th at Llandrindod Wells of Dr. A. J. M. Bentley shortly after his arrival from Egypt for the summer season. Dr. Bentley received his professional education at Edinburgh, and qualified in 1871, taking his M.D. degree 18 years later, when he received the gold medal of the University. After obtaining various resident appointments at the Edinburgh Royal Infirmary, he held the posts of colonial surgeon to the Straits Settlements, medical adviser to the Johore Government and physician to the Sultan, and surgeon to the Lock and Chinese Hospitals and visiting surgeon to the Leper Hospital at Singapore. Of late years he practised alternately at Llandrindod Wells during the summer and at Cairo during the winter. In 1893 he published a work on "Beri-beri, its Etiology, Symptoms, Pathology, and Treatment," which was especially valuable for its clinical studies, and he was the author of several books and papers on Egypt as a winter health resort. Dr. Bentley was due to lecture at the Owens College, Manchester, upon Tropical Diseases on the day following his sudden death. The evidence at the inquest showed that death was due to asphyxia caused by hæmorrhage following rupture of one of the great vessels of the heart.

### JOSEPH CARNE ROSS, M.D. EDIN., F.R.C.P. EDIN., F.G.S., F.R.HIST.S., F.S.A. SCOT.

THE death is announced of Dr. Joseph Carne Ross at Withington, Manchester, in his sixty-seventh year. After studying at the University of Edinburgh he qualified in 1880, and obtained the M.D. degree of that university and the Fellowship of the Royal College of Physicians of Edinburgh two years later. After holding house appointments at the Royal Infirmary Dr. Ross left Edinburgh and subsequently settled in Manchester where he became physician to Ancoats Hospital. He was a fellow of various learned societies and was for a time honorary physician to the West Cornwall Infirmary. He published "The Treatment of Pleurisy with Effusion."

### BEVERLEY STEWART RINGER, M.D. DURH., M.R.C.S. ENG., L.S.A.

Dr. B. S. Ringer has died at Stockbridge, Hants, at the age of 66. He was educated at St. Bartholomew's Hospital and qualified in 1869, and after acting as resident medical officer to the Metropolitan Free Hospital he held the posts of medical officer to the British Consulate and the Chinese I.M. Customs at Canton. When in Formosa Dr. Ringer discovered the trematode worm, named after him Distoma ringeri, which infests human beings in China and Japan.

### HENRY EUGENE TRACEY, M.B. LOND., L.R.C.P. LOND., M.R.C.S. ENG.

Dr. H. E. Tracey of "The Gables," Willand, Devon, died on April 14th in his forty-fifth year. He was the youngest son of the late Rev. H. E. F. Tracey of Plympton St. Mary, and received his medical education at St. Bartholomew's Hospital, qualifying in 1892. Shortly afterwards he commenced practice at Willand, where he soon established an extensive connexion. Dr. Tracey will be greatly missed in Willand, Cullompton, and Tiverton. He leaves a widow and 11 children. The funeral took place at Willand churchyard on April 19th and was very largely attended.

DEATHS OF EMINENT FOREIGN MEDICAL MEN.—The deaths of the following eminent foreign medical men are announced: Dr. Oskar Königshöfer of Stuttgart, whose name is known not merely as an eminent ophthalmologist but also for the great interest he took in the important controversies that have been carried on for several years past in Germany concerning the attendance of medical men on members of working-class clubs.—Dr. E. F. Cushing, professor of children's diseases in the Western University, Cleveland.—Dr. N. Bocharoff, *privat-docent* of surgery in the St. Petersburg Military Medical Academy.—Dr. Theodor Bakody, who was appointed extraordinary professor of homœopathic pathology and therapeutics in the University of Budapest in 1873. When advancing age compelled him to relinquish this post no one could be found to succeed him, and for many years there has been no attempt to teach homœopathy from the University chairs.

# Medical News.

SOCIETY OF APOTHECARIES OF LONDON.—At examinations held recently the following candidates passed in the subjects indicated:—

*Surgery.*—G. J. F. Elphick (Sections I. and II.), St. Mary's Hospital; J. B. Holmes (Sections I. and II.), Manchester; T. T. O'Callaghan (Sections I. and II.), Guy's Hospital; H. L. Tidy (Sections I. and II.), London Hospital; and G. H. Varley (Sections I. and II.), Oxford and St. George's Hospital.

*Medicine.*—H. H. Budd (Sections I. and II.), St. Mary's Hospital; J. B. Holmes (Section II.), Manchester; J. E. S. Sheppard-Jones (Section I.), Cambridge and St. Thomas's Hospital; and H. L. Tidy (Sections I. and II.), London Hospital.

*Forensic Medicine.*—R. E. Laurent, Royal Colleges of Physicians and Surgeons, Edinburgh; P. McGinnis, Dublin, and H. L. Tidy, London Hospital.

*Midwifery.*—N. S. Adler, Berlin; R. E. Laurent, Royal Colleges of Physicians and Surgeons, Edinburgh; P. McGinnis, Dublin; H. L. Tidy, London Hospital; and G. H. Varley, Oxford and St. George's Hospital.

The diploma of the Society was granted to the following candidates, entitling them to practise medicine, surgery, and midwifery:—G. J. F. Elphick, J. B. Holmes, T. T. O'Callaghan, and H. L. Tidy.

FOREIGN UNIVERSITY INTELLIGENCE.—*Berlin:* Dr. E. Abderhalden, Director of the Physiological Institute of the Veterinary College, has been offered the chair of Physiology in the University of Halle.—*Bonn:* In the Legal Faculty an appointment has been made which has considerable interest for the medical profession. Dr. Stier-Somlo, *dozent* of Political Science, has been appointed to lecture on Working-class Insurance Law. The lecturer has for some time past shown himself an opponent of the medical point of view in matters concerning practice amongst workmen's clubs.—*Breslau:* Dr. W. Filehne has retired from the chair of Pharmacology, which he has held since 1886.—*Budapest:* Dr. Béla Rihmer has been recognised as *privat-docent* of Surgical Urology.—*Florence:* Dr. Augusto Franchetti has been recognised as *privat-docent* of General Pathology, and Dr. Giuseppe Conforti as *privat-docent* of External Pathology.—*Giessen:* Dr. von Eicken has been promoted to the Ordinary Professorship of Otology and Laryngology.—*Königsberg:* Dr. Karl Klieneberger, *privat-docent* of medicine, has been granted the title of Professor.—*Modena:* Dr. Arturo Donaggio of Messina has been appointed to the chair of Neurology and Psychiatry.—*Naples:* Dr. Raffaele Paladino has been recognised as *privat-docent* of Physiological Chemistry, and Dr. Giuseppe Ronchi as *privat-docent* of Dermatology.—*Pavia:* Dr. Giulio Ascoli has been recognised as *privat-docent* of Medicine.—*Philadelphia (University of Pennsylvania):* Dr. Gwilym G. Davis, Adjunct Professor of Anatomy, has been appointed Professor of Orthopædic Surgery, in succession to the late Dr. De Forest Willard.—*Rome:* Dr. Stefano Mircoli has been recognised as *privat-docent* of Internal Pathology.—*Sienna:* Dr. Giuseppe Moriani has been recognised as *privat-docent* of Pathological Anatomy, and Dr. Roberto Malatesta as *privat-docent* of Surgery and Operative Medicine.—*Strasburg:* Dr. Stolz, *privat-docent* of surgery, has been granted the title of Professor.—*Turin:* Dr. Alberto Civalleri has been recognised as *privat-docent* of Anatomy.—*Upsala:* Dr. Gunnar Forssner of Stockholm has been appointed Professor of Children's Diseases.—*Vienna:* Dr. H. Salzer has been recognised as *privat-docent* of Surgery.

THE ROYAL SANITARY INSTITUTE.—Dr. M. S. Pembrey will deliver a lecture at the Institute, 90, Buckingham Palace-road, London, S.W., on "The Physiological Principles of Physical Training," on Wednesday, May 3rd, at 5 P.M.

UNIVERSITY COLLEGE HOSPITAL.—A course of six lectures will be given at the Medical School of this hospital by Dr. Thomas Lewis on the Graphic Methods of Investigating Heart Disease. The lectures will include a description of recent anatomical discoveries, the sino-auricular node, the auriculo-ventricular node and bundle, and the functions of these structures. They will deal with graphic records, especially the polygraphic and electrocardiographic methods, and the results of their employment. Attention will be paid to disorders of the cardiac mechanism and their pathology. Heart-block, pathological impulse formation in the heart musculature (i.e., single premature beats, paroxysmal tachycardia, and auricular fibrillation), and alternation

will be discussed, as will be also the action of members of the digitalis group of drugs. The lectures, which will be illustrated by the demonstration of cases and by specimens and photographs, will be given on Friday afternoons at 4 o'clock, commencing May 5th, and are free to all students and members of the medical profession on presentation of visiting card.

A PROPOSED MUSEUM OF PUBLIC HEALTH.—A proposal has emanated from the National League for Physical Education for the establishment in some district within reach of the poorer inhabitants of London of a "Museum of Public Health" as a memorial to King Edward.

THE MARY WARDELL CONVALESCENT HOME FOR SCARLET FEVER.—The report of this institution for the year 1910 shows that 103 patients were admitted to the home during the year. The committee of management announces that Her Majesty Queen Alexandra has become an annual subscriber and that a grant of £500 from the executors of the late Louisa Lady Goldsmid has freed the home from debt. Subscriptions may be sent to the bankers, Messrs. Barclay and Co., Limited, 1, Pall Mall East, S.W., or to Miss Mary Wardell, Stanmore, Middlesex.

NURSES' MISSIONARY LEAGUE.—An all-day Missionary Exhibition for members of the nursing profession will be held on Wednesday, May 10th, from 9.30 A.M. to 9.30 P.M., at Holborn Hall (corner of Gray's Inn-road and Clerkenwell-road). There will be on view models of mission hospitals, native instruments and drugs, and curios. There will be short addresses at intervals, and Mr. W. McAdam Eccles, Rev. J. Anderson Robertson, M.B., and Miss C. M. Ironside, M.B., will be among the speakers. Tickets and all further particulars may be obtained from Miss H. Y. Richardson, 52, Lower Sloane-street, London, S.W.

SALFORD ROYAL HOSPITAL.—The monthly meeting of the board of management of this hospital was held on April 19th, Mr. Lawrence Pilkington being in the chair. The board accepted with much regret the resignation of Mr. Andrew Boutflower, the senior honorary surgeon. Mr. Boutflower was appointed at the end of the year 1870, on the resignation of his father after nearly 44 years' service, so that father and son together have served the poor and needy at the hospital for more than 84 years. Mr. Boutflower was appointed an honorary consulting surgeon to the hospital.

THE HOSPITAL SATURDAY FUND.—The report of this Fund for the year 1910 is of a most satisfactory character. The income amounted to £34,694, exceeding that for 1909 by no less than £4032. The total sum collected by local committees was £5788, as compared with £4505 collected in 1909. The following is a summary of the awards: General and special hospitals, £21,255; convalescent homes, £1776; dispensaries, £904; nursing institutions, £513; distribution committee, £5759 (this committee, in addition to other work, dealt with 2991 applications for dental assistance, and received in part payment £4363); surgical appliance committee, £1800; ambulance committee, £166; miscellaneous institutions, £266. The total sum distributed was £32,439, an increase of £4327 on the amount distributed in 1909. The surgical appliance committee supplied 6174 appliances during the year, at a cost of £2682, towards which the recipients contributed £1276.

SOCIETY FOR RELIEF OF WIDOWS AND ORPHANS OF MEDICAL MEN.—A quarterly court of the directors of the above society was held on April 12th, Dr. G. F. Blandford, the President, being in the chair. Sixteen directors were present. Two gentlemen were elected members of the society. The report and balance sheet for the year 1910, to be submitted at the annual general meeting, were approved. The invested funds of the society now amount to £100,900. Relief is only granted to the widows and orphans of deceased members. Membership is open to any registered medical practitioner who at the time of his election is residing within a 20-mile radius of Charing Cross. The annual subscription is 2 guineas. Special terms for life-membership according to the age of the candidate. Full particulars and application forms of membership may be obtained from the secretary at the offices of the society, 11, Chandos-street, Cavendish-square, London, W. The annual general meeting will take place on May 17th, at 5 P.M.

NOTTINGHAM CHILDREN'S HOSPITAL.—According to the annual report of this institution, presented on April 12th, the Nottingham Children's Hospital this year enjoys the almost unique experience of an increase of income over expenditure to the extent of nearly £70. The board of management expressed its indebtedness to the lady superintendent, Miss Royds, for the great decrease in expenditure.

A STUDENTSHIP in Physiology at the University of London will be awarded to a student qualified to undertake research work, tenable in a physiological laboratory of the University or one of its schools. It will be of the value of £50 for one year, and will be awarded annually if a candidate of sufficient merit presents himself. Candidates must be matriculated students or graduates of the University and must submit a statement of their qualifications, with the names of three references. Applications must be received by the Principal before May 31st next.

DONATIONS AND BEQUESTS.—Under the will of the late Mr. W. Woolland, King Edward's Hospital Fund will receive £1000, the Royal Devon Hospital, Exeter, £500; the Royal Hospital, Winchester, £500; and Dr. Barnardo's Homes, £300.—By the will of the late Miss Sarah Hampson the testatrix bequeathed £1000 each to the Manchester Royal Infirmary, the Bury Infirmary, the Southport Infirmary, the Pendlebury Children's Hospital, and the Radcliffe and Whitefield Consumptives' Relief Fund.—The Rev. Henry Drayton Wyatt, who left estate of the gross value of £10,625, of which the net personalty has been sworn at £6806, by will bequeathed a freehold ground-rent at Woolwich producing £30 per annum to his niece for life, with remainder to the Royal Surrey County Hospital, Guildford, and to his cook a life-interest in a trust fund of £500, with remainder to the same hospital; to the Aldershot Cottage Hospital the proceeds of the sale of his residence Drayton Lodge. Among other bequests he left £300 each to the Great Northern Hospital, London, and the Brompton Cancer Hospital.

THE INVALID CHILDREN'S AID ASSOCIATION.—At a meeting held recently, on the invitation of Mrs. Kendal, at 12, Portland-place, at which the Hon. Sir Charles W. Fremantle presided, it was pointed out that the extension of the field of activity of the association and the aid given to children in the early stage of phthisis had been a heavy drain on its treasury. The latter cause, the chairman said, would continue to operate increasingly. Sir Alfred Fripp proposed the formation of a special committee on finance, and pleaded for an additional £1000 a year, towards which sum he had already received three promises of £100 a year each.—The annual meeting will be held, by kind permission of Sir Edwin Durning-Lawrence, M.P., at 13, Carlton House-terrace, S.W., on Friday afternoon, May 19th, at 3 o'clock. Sir Edwin Durning-Lawrence will preside, and the Hon. and Ven. Dr. K. G. Gibbs, the Archdeacon of St. Albans, Mrs. Kendal, Miss Broadbent, Mr. Edmund Owen, and Mr. Silas Hocking will be among the speakers. Admission will be by ticket only, application for which may be made to the secretary, 69, Denison House, 296, Vauxhall Bridge-road, Westminster, S.W.

# Parliamentary Intelligence.

## NOTES ON CURRENT TOPICS.

*St. Andrew's Ambulance Association.*

THE LORD ADVOCATE has introduced into the House of Commons a Bill to confirm an Order relating to the St. Andrew's Ambulance Association, made under the Private Legislation Procedure (Scotland) Act.

## HOUSE OF COMMONS.

WEDNESDAY, APRIL 19TH.

*Nutritive Values of Flour.*

Answering Mr. CHIOZZA MONEY, Mr. BURNS said: A report on the nutritive values of flour is in preparation and will shortly be issued.

*The Milk Standard in the North-Eastern Counties.*

Mr. ORDE POWLETT asked the Parliamentary Secretary to the Board of Agriculture whether his attention had been called to the recent prosecutions under the Sale of Milk Regulations, 1901, in the north-eastern counties, and particularly to the decision of the Recorder of Middlesbrough at the April quarter sessions in a milk appeal case

which came before him on the 7th instant; whether he was aware that the effect of the Recorder's decision had been to make the presumptive standard of the Sale of Milk Regulations an absolute standard, so that it was now useless for farmers in this district to defend cases in which their milk had been found to fall temporarily below the standard set up by the Sale of Milk Regulations; and whether, in view of the special liability of milk in this district, as was proved by the scientifically conducted experiments at Garforth experimental farm and the Offerton Hall dairy farm, as well as by the practical experience of dairy farmers in all parts of this district, to fall below this standard temporarily, especially at this period of the year, he would consider the advisability of immediately suspending the Sale of Milk Regulations, 1901, in the north-eastern counties pending a full inquiry into the administration of the Sale of Food and Drugs Acts, as they affected the dairy industry.—Sir EDWARD STRACHEY wrote in reply: My attention has been called to the case to which the honourable Member refers, but so far as can be gathered from the newspaper reports the decision of the Recorder does not put any new interpretation upon the law. The Board are making inquiry as to the administration of the Food and Drugs Acts in relation to milk generally, but until further information is available they do not see their way to adopt the suggestion made in the last part of the question.

THURSDAY, APRIL 20TH.

*Phosphorus in Indian Matches.*

Viscount WOLMER asked the Under Secretary of State for India whether he could give an approximate date for the introduction of legislation with regard to the prohibition in India of the manufacture, sale, and importation of matches, in the making of which yellow phosphorus had been employed.—Mr. MONTAGUE replied: I do not anticipate that the Bill can be introduced until the Legislative Council assembles in Calcutta at the end of the year.

FRIDAY, APRIL 21ST.

*Asylum Officers (Employment, Pensions, and Superannuation) Bill.*

Viscount WOLMER moved the second reading of the Asylum Officers (Employment, Pensions, and Superannuation) Bill, which he hoped the House would find so simple and non-contentious that it would be allowed quickly to be sent to a committee. The objects of the Bill were as follows. All the clauses with the exception of the first were intended to remedy minor defects which experience had shown to exist in the Asylum Officers Superannuation Act of 1909. The clauses which dealt with the minor amendments of that Act were not very important. It was to the first clause that he wished to direct special attention. Clause 1 limited the hours of duty of asylum officers and nurses to 60 per week. No profession could be found in which the claim for legislative interference could more reasonably be put forward, and no class of persons was more entitled to consideration in this respect than was the class whose duty it was to attend perpetually inside lunatic asylums. Asylum attendants and nurses were called upon to have intimate charge of the insane, and their responsibility was tremendous. Obviously it was difficult to exaggerate the importance of getting the very best class of persons to look after and attend lunatics in asylums, and patients could not be expected to recover unless they were attended by men and women who were in every way fitted for their position, not only by character, but also by long experience of the duties. In existing conditions it was difficult to get the right sort of men and women to consent to enter the service af asylums. He believed that the greater part of asylums in this country were at present short of attendants and nurses. Not only was that the case, but there was a frequent change of attendants because the duties were so hard and the conditions so insupportable that only a very small percentage could ever afford to stay their full time at their duties. Obviously all these conditions militated against the efficiency of asylums, and anything which would improve the conditions of attendants and nurses and put them upon a more reasonable basis would also affect the health and prospects of the unfortunate inmates and patients in those asylums. Let the House consider under what conditions the attendants worked. They were employed in a continuous atmosphere of danger and even of horror. They were exposed to infection from the most appalling diseases. They ran constant danger of murderous attacks on their lives. They were called upon to perform sometimes the most loathsome duties. Under those circumstances, he would submit, they deserved greater consideration than any other class of workers in this country. They witnessed scenes daily that would be sufficient to unnerve an ordinary person, and during the whole time when they were on duty it was impossible for them to relax their attention from their occupation because they never knew when some attack would be made upon them. Every patient was to a certain extent an unknown factor. He had carefully gone into the matter of the hours of attendants at the present moment and he had found that the average hours of work of asylum attendants worked out at about 13 hours a day. It was immoral and wrong that men and women should be compelled to work 13 hours a day on an average under conditions which were as arduous as, if not more arduous than, any others which existed in our civilisation. Therefore he would beg of the House to give the most sympathetic consideration to the position of asylum attendants and nurses. Clause 1 of the Bill limited the hours of duty for asylum attendants to 60 hours a week. It would not be an unreasonable proposal that the hours should be limited to ten hours a day and that every attendant and nurse should have one day's rest in seven. However, the Bill did not go that length. Its promoters had only provided that there should be a working week of 60 hours, considering the conditions under which the nurses and attendants had to work. They thought that they could with perfect safety take that as the general rule. He was prepared to admit that emergencies might arise in an asylum when it would be impossible that this rule could be adhered to, and when overtime had to be worked on account of the illness of attendants. There was a great deal of illness amongst them. Perhaps other emergencies might arise which would cause the necessity of extra work by the attendants and nurses. If honourable Members would look at the clause they would see that there was ample provision for perfect elasticity, and there was nothing to prevent any medical superintendent of any asylum from employing a subordinate to work overtime on an emergency. The Bill laid down that any man so employed should be entitled to special remuneration for such overtime work. That he submitted was a reasonable proposal. Clause 2 of the Bill merely substituted a service of 25 years in order to entitle a man to a pension for the provision in the Act of 1909, which laid down that the qualification for a pension was to be 20 years' service and 55 years of age. In Clause 3 there was a provision which enabled the visiting committee of an asylum to grant a pension to any man in their employment who was incapacitated by an accident not due to his own fault. By Clause 4 no attendant could be permanently dismissed without having had an opportunity of bringing his case before the visiting committee. There was nothing in the clause to prevent a man from being dismissed at a moment's notice by the medical superintendent, but it simply laid down that the next time the visiting committee met the man should have an opportunity to come forward and demand an explanation of his dismissal. He thought that was a thoroughly reasonable proposal. By Clause 5 asylum officers would be allowed to count all the years they had served when they were calculating for pensions, although they might have been transferred from one asylum to another. Clause 6 allowed the attendant to calculate the rate of his pension from the average of the last three years of his term of service. Clause 7 merely included two Scottish asylums which, owing to peculiar circumstances, were left out of the Act of 1909. Those two asylums during the passing of the Act were in course of transference from the parish to the county authority. The clause would simply put those asylums in the same position as all other similar asylums in Scotland. These were the main provisions of the Bill. What additional cost would they entail? As regards the pension part, he did not think that it would increase the rates. The Act of 1909 provided a contributory pension scheme, and the amounts contributed so far had more than provided for the amounts given out under the Act. Clause 1, which limited the hours to 60 per week, was bound to lead to some slight increase in the county rates, but it would be a very small thing as compared with the benefit which would be secured to the nurses and attendants. It would be money well spent.

Mr. ORMSBY-GORE supported the principle of the Bill.

Sir FREDERICK BANBURY opposed the second reading. He said that he was opposed to the regulation and limitation by the State of the hours of adult male labour. If honourable Members began to limit the hours of adult male labour they were not going to stop at asylums or anything else. The Bill had been printed for so short a time that he could not see how local authorities could have been consulted with regard to it. How was discipline going to be maintained in an asylum if the authorities in the asylum could not dismiss a man when they deemed it necessary?

Viscount WOLMER: The honourable baronet does not appear to have read the Bill very carefully. There is in it nothing to prevent a man being dismissed at a moment's notice, but when he has been dismissed he has a right to have his case heard at the next meeting of the visiting committee.

Sir FREDERICK BANBURY: Surely that is the same thing. If the authorities of the asylum dismiss a man he can go to the visiting committee and they can keep him on. In what position does that place the authorities? They may have dismissed the man because they knew he was not doing his duty properly. The visiting committee would know nothing about that. It might consist of large-hearted gentlemen who might come to the conclusion that the man had been very harshly treated. They might indeed be misled and deluded into putting him back again into his position, and the authorities would be helpless. The honourable baronet went on to remark that the more he looked into the terms of the Bill the more he was forced to the conclusion that it was a very bad one.

Mr. WILLIAM REDMOND supported the second reading.

Mr. CHARLES ROBERTS suggested that the Bill should be sent to a select committee.

Mr. RAWLINSON considered the Bill to be in far too crude a condition to be the basis of legislation.

Mr. MASTERMAN (Under Secretary of State for the Home Department) said that it had quite rightly been pointed out that a good deal of the work done by asylum attendants bore no kind of relation to the work which the miner and the shop assistant were doing—men who were at work in one place for more than 60 hours a week and for whose benefit legislation had been proposed or carried. There was some trying work to be done by asylum attendants, but in their case there was a considerable opportunity for getting fresh air and recreation during their hours of labour which workers in shops and coal mines had not got. It would, however, seem to most Members of the House that the hours of asylum attendants, if they could be reduced without undue expenditure to the local authority, should certainly be reduced. But when honourable Members went beyond general affirmations of that kind they would find that they were dealing with matters upon which the House had no data on which to make up its mind. He had been anxious to see whether the noble lord and those who were advising him had any kind of information as to the cost of the changes which were proposed, but the noble lord had been unable to supply such information. The House was being asked to impose on the local authorities an indefinite amount of increased expenditure. The only suggestion which the Lunacy Commission was able to make, when this question was last raised in 1906, was that anything like a provision of 60 hours a week would mean a cost in its opinion absolutely prohibitive. The only way in which they could see that such a plan could be worked would be the substitution of three shifts for two shifts in the work. That would mean an enormous increase in the staff. Indeed, he was not sure whether the trained staff would be obtained in reasonable time to make that increase, and consequently there would be an enormous increase in the expenditure. There might, however, be other means whereby the hours might be reduced, besides the inclusion of a certain number of supplementary attendants or the readjustment of hours, and if there were any means by which these hours could be reduced it was certainly desirable that the House should ascertain if that was so by a select committee. Clause 1 was the operative and essential part of the Bill, but he doubted if, for instance, Clause 2 should be passed without considerable discussion. The Act of 1909 had not been in operation for much more than a year, and now the House was asked to make considerable alterations in it. It was rather a strong step to take, to begin once more grubbing at a measure which had been in force only a few days over a year. He did not think it altogether fair to ask the House to go back on its decision so soon. Therefore he would strongly urge the noble lord to accept the

suggestion to have the Bill sent to a select committee. He did not think that the noble lord would lose anything by doing so, because he doubted whether he would be able to get it through Grand Committee and through the House afterwards. He (Mr. Masterman) thought that it would be very desirable that the attention of those who were interested in this problem might be fixed during this summer on the whole question, that the evidence might be taken, and that honourable Members might see what the attitude of the local authorities would be, whether any modification of the Bill was desired, and whether without this hard-and-fast line being laid down at about 60 hours some general effort might not be made to reduce the hours of these most hard-working and deserving servants of the community. If the noble lord saw his way to accept that proposition the Government would be ready to support the second reading.

Mr. SWIFT, speaking as one of the Members who had been associated in the preparation of the Bill, thought that the proposition of the Government might be cheerfully accepted.

Dr. ADDISON said that there were provisions in the Bill which a select committee, he felt sure, would delete. He recognised that many of the attendants had a very trying time. However, a considerable number were engaged upon work which could scarcely be described as very trying. The work of the attendants depended on the class of patients whom they had in their charge. A considerable number of them were employed in wards where there were intractable patients, and no doubt the hours during which many of them were engaged were exceedingly onerous both for patients and attendants. A serious omission in the Bill was that it did not include licensed houses, and he thought that when the select committee got to work, it would find that the injustices in licensed houses and in places which were not under authority, were in very much more need of attention than those which existed in large public asylums. Nevertheless, he would like to give a hearty support to the general principle of the Bill, but it ought to be sent to a select committee. The Bill was very badly drafted.

At 5 o'clock the discussion on the Bill was closured by 105 votes to 3. The Bill was then read a second time and committed to a select committee.

MONDAY, APRIL 24TH.

*The Care and Control of the Feeble-minded.*

Mr. JAMES PARKER asked the Secretary of State for the Home Department what action it was proposed to take on the report of the Royal Commission on the Care and Control of the Feeble-minded; and whether he would consider the possibility of introducing a Bill embodying, at any rate, some of the recommendations contained in the report.—Mr. CHURCHILL replied: I am most anxious for action in this field, and work preparatory to legislation is proceeding. I am not wholly without hope of being able to introduce a Bill this session, but only universal goodwill could carry it forward into law.

TUESDAY, APRIL 25TH.

*Aliens and Trachoma.*

Mr. HUNT asked the Secretary of State for the Home Department whether, in view of the fact that Dr. Eason, the senior ophthalmic surgeon to Guy's Hospital, stated this month that less than a quarter of the number of aliens who came into this country in 1910 were rejected for eye disease (trachoma) than was the case in 1909, and that this was because the examination was relaxed, he would make the regulations sufficiently strong and the examination so careful that no more aliens should be permitted to enter this country and spread blindness amongst our own people.—Mr. CHURCHILL replied: It is not the fact that the medical inspection under the Aliens Act has been in any way relaxed in 1910, and Dr. Eason did not say that it had been. He merely inferred that it might be so from the reduction in the number of rejections for trachoma in 1910 as compared with 1909, and he now admits that his inference was wrong. The real reasons for this reduction are, firstly, that in consequence no doubt of the rejections in previous years the number of aliens suffering from trachoma who arrived on immigrant ships decreased, and secondly, that the figures of 1909 were swollen through the arrival in special circumstances of numbers of Armenians and Syrians who were suffering from the disease. The honourable member will find information on the latter point in the annual report for 1909 of the inspector under the Act.

## BOOKS, ETC., RECEIVED.

HIRTHS (G.) VERLAG, G.m.b.H., München.

Der elektrochemische Betrieb der Organismen und die Salzlösung als Elektrolyt und Elektrogenet. Eine Programmschrift für Naturforscher und Aerzte. Von Georg Hirth. Dritte vermehrte Auflage (Drittes Tausend). Price M.1.

HIRSCHWALD, AUGUST, Berlin.

Franz König. Gedenkrede gehalten am 16 Februar, 1911. Von Prof. Dr. Otto Hildebrand, Geh. Med.-Rat. Price M.1.

LEHMANN, J. F., München.

Jubiläumsschrift zum 50 Jährigen Gedenken der Begründung der Lokalistischen Lehre Max Pettenkofers. IV. Band. Typhus und Trinkwasser. Kritische Untersuchungen. Von Dr. R. J. Beck, Stadtarzt in Mengen. Price M.3.

MARHOLD, CARL, Verlagsbuchhandlung, Halle a.S.

Sammlung zwangloser Abhandlungen aus dem Gebiete der Verdauungs- und Stoffwechsel-Krankheiten. Herausgegeben von Professor Dr. A. Albu in Berlin. III. Band, Heft 2. Über die Bedeutung der Inanition bei Ernährungsstörungen der Säuglinge Von Prof. Ad. Czerny in Strassburg. Price M.1.

MASSON ET CIE., Paris.

Chaleur Animale et Bioénergétique. Par Jules Lefèvre, Agrégé de l'Université, Lauréat de l'Institut et de la Société de Biologie. Préface de M. A. Dastre de l'Institut et de l'Académie de Médecine. Price Fr.25.

Techniques du Diagnostic par la Méthode de Déviation du Complément. Par P. F. Armand-Delille. Price Fr.5.

REEVES, WILLIAM, 83, Charing Cross-road, London, W.C.

Vocal Science and Art. Being Hints on the Production of Musical Tone. By the Rev. Chas. Gib, Vicar of St. Philip's Church, Buckingham Palace-road, London. With numerous illustrations, together with an Introduction, notes and diagrams by J. F. Halls Daly, M.A., M.D., B.C. Cantab., M.R.C.P. Lond., &c. Price 3s. 6d.

SPRINGER, JULIUS, Berlin.

Beiträge zur Pathologie und Therapie der Syphilis. Unter Mitwirkung von Dr. G. Bärmann, Petoemboekan (Sumatra), Dr. C. Bruck, Breslau, Dr. Dohi, Tokio, Dr. Kobayashi, Sashedo (Japan), Erich Kuznitzky, Breslau, Dr. R. Pürckhauer, Dresden, Dr. L. Halberstädter, Berlin, Dr. S. Von Prowazek, Hamburg, Dr. Schereschewsky, Göttingen, und Dr. C. Siebert, Charlottenburg. Herausgegeben von Dr. Albert Neisser, Ordentlicher Professor an der Universität Breslau, Geheimer Medizinalrat. Price not stated.

# Appointments.

*Successful applicants for Vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward to* THE LANCET *Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, such information for gratuitous publication.*

ALLANSON, H. E., M.B., Ch.B. Vict., has been appointed Senior House Surgeon at the Ancoats Hospital, Manchester.

APPLEYARD, WILLIAM, M.B., B.S. Lond., F.R.C.S. Eng., has been appointed Assistant Surgeon to the Bradford Royal Eye and Ear Hospital.

ASHTON, GEORGE, M.D. Vict., has been re-appointed Medical Officer for Home Patients of the Manchester Royal Infirmary.

BRIDE, J. W., M.B., B.S. Lond., has been re-appointed Medical Officer at the Central Branch of the Manchester Royal Infirmary.

BROWN, WILLIAM, M.D., C.M. Glasg., has been appointed Medical Adviser in Lunacy Cases to the Bristol Bench of Magistrates.

COCKER, J. F., M.B., Ch.B. Vict., has been appointed Junior House Surgeon at the Manchester Royal Infirmary.

CUNNINGHAM, H. W., M.D.R.U.I., has been appointed Honorary Physician to the Londonderry Infirmary.

DUNNE, A. B., M.B., B.C. Cantab., D.P.H. Lond., has been appointed Medical Officer of Health for the Doncaster Rural District Council.

EATOCK, E. R., M.B., Ch.B. Vict., has been appointed Junior Surgeon at the Manchester Royal Infirmary.

FITCOMBE, R. H., M.B., Ch.B. Vict., has been appointed Junior House Surgeon at the Ancoats Hospital, Manchester.

GRAY, E., M.B., Ch.B. Vict., has been appointed House Physician at the Manchester Royal Infirmary.

GRIFFITH, G. R., M.B., M.C. Glasg., has been appointed Certifying Surgeon under the Factory and Workshop Act for the Carnarvon District of the county of Carnarvon.

HARVEY, FRANCIS M., M.R.C.S., L.R.C.P. Lond., has been appointed Assistant Medical Officer to the British Hospital, Buenos Aires.

HIBBERT, CECIL, M.B., Ch.B. Vict., has been re-appointed Medical Officer at the Central Branch of the Manchester Royal Infirmary.

JEWESBURY, REGINALD C., M.B., B.Ch. Oxon., M.R.C.P. Lond., has been appointed Assistant Physician to the London Fever Hospital.

MACDONALD, ARTHUR HARKNESS, M.D. Prux., L.R.C.P. Lond., M.R.C.S., D.P.H. Oxf., has been appointed District Medical Officer to the Warminster (Wilts) Board of Guardians.

MCDONALD, N., M.B., Ch.B. Vict., M.R.C.S., L.R.C.P. Lond., has been appointed House Physician at the Ancoats Hospital, Manchester.

M'LAUGHLIN, F., M.D.R.U.I., has been appointed Honorary Surgeon to the Londonderry Infirmary.

MOORE, REGINALD M., M.A., M.B., B.C. Cantab., M.R.C.S., L.R.C.P. Lond., has been appointed Medical Officer of Health of the Rural District of Malmesbury.

PONTON, JOHN ALFRED WILLIAM, M.B., B.Ch., B.A.O. Dub., has been appointed Medical Officer for the Ottery St. Mary District by the Honiton (Devon) Board of Guardians.

SCOTT, ALEXANDER R. P., M.R.C.S., L.R.C.P. Lond., has been appointed Assistant House Surgeon at the Poplar Hospital.

YOUNG, WILLIAM SEMPLE, M.D. Glasg., has been appointed one of the Medical Referees under the Workmen's Compensation Act, 1906, for the Sheriffdom of Stirling, Dumbarton, and Clackmannan, to be attached more particularly to the Dumbarton District.

# Vacancies.

*For further information regarding each vacancy reference should be made to the advertisement (see Index).*

BARNSLEY, BECKETT HOSPITAL.—Second House Surgeon, unmarried. Salary £80 per annum and all found.

BATH ROYAL UNITED HOSPITAL.—House Surgeon. Salary £80 per annum, with board, lodging, and washing.

BELGRAVE HOSPITAL FOR CHILDREN, Clapham-road, S.W.—Resident Medical Officer for six months. Salary at rate of £60 per annum, with board, residence, &c.

BIRKENHEAD BOROUGH HOSPITAL.—Junior Resident House Surgeon. Salary £80 per annum.

BIRMINGHAM AND MIDLAND EYE HOSPITAL.—Resident Surgical Officer. Salary £100 per annum.

BOLINGBROKE HOSPITAL, Wandsworth Common, S.W.—House Surgeon for six months. Salary £75 per annum, with board and residence.

BRISTOL GENERAL HOSPITAL.—Casualty House Surgeon for six months. Salary £60, with board, residence, &c.

BRISTOL ROYAL HOSPITAL FOR SICK CHILDREN AND WOMEN.—Junior Resident Officer. Salary £90 per annum, with rooms and attendance.

BURY ST. EDMUNDS, WEST SUFFOLK GENERAL HOSPITAL.—House Surgeon, unmarried. Salary £100 per annum, with board, lodging, and washing.

CAMBRIDGE, COUNTY ASYLUM.—Second Assistant Medical Officer, unmarried. Salary £140 per annum, with board, lodging, and attendance.

CAPE TOWN, SOUTH AFRICAN COLLEGE.—Professor of Physiology. Salary £500 per annum.

CHELTENHAM GENERAL HOSPITAL.—House Physician, unmarried. Salary £80 per annum, with board, lodging, and washing.

DEVONPORT, ROYAL ALBERT HOSPITAL.—Assistant Resident Medical Officer for six months, unmarried. Salary at rate of £50 per annum, with board, apartments, and laundry

DOUGLAS, NOBLE'S ISLE OF MAN HOSPITAL AND DISPENSARY.—Resident House Surgeon, unmarried. Salary £90 per annum, with board and washing.

DREADNOUGHT HOSPITAL, Greenwich, S.E.—Locum Tenens for Medical Superintendent for six months.

EAST LONDON HOSPITAL FOR CHILDREN AND DISPENSARY FOR WOMEN, Shadwell, E.—Medical Officer for Electrical Department. Salary at rate of £75 per annum, with luncheon and tea.

EXMINSTER, DEVON COUNTY ASYLUM.—Third Assistant Medical Officer. Salary £140 per annum, all found.

GROSVENOR HOSPITAL FOR WOMEN, Vincent-square, Westminster.—Surgical Registrar. Also Two Clinical Assistants to Out-patients.

HACKNEY UNION WORKHOUSES, Homerton and Hackney Wick.—Second Assistant Medical Officer, unmarried. Salary £120 per annum, with rations, apartments, washing, and attendance.

HASTINGS, EAST SUSSEX HOSPITAL.—Assistant House Surgeon for six months. Salary at rate of £50 per annum, with rooms, board, and washing.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.—Assistant Casualty Medical Officer and House Physician for six months, unmarried. Salary £30, with board, residence, &c.

KING'S COLLEGE HOSPITAL.—Sambrooke Medical Registrar. Also Clinical Assistants.

LEEDS GENERAL INFIRMARY.—Ophthalmic Officer. Salary £100 per annum, with board, residence, and washing. Also Medical Officer for Ida and Robert Arthington Hospitals for six months. Salary £30. Also Obstetric Officer, Two House Physicians, House Surgeon, and Ophthalmic House Surgeon.

LEEDS PUBLIC DISPENSARY.—Junior Resident Medical Officer. Salary £100 per annum, with board and lodging.

LINCOLN GENERAL DISPENSARY.—Resident Junior Medical Officer, unmarried. Salary £175 per annum, with apartments, &c.

LIVERPOOL STANLEY HOSPITAL.—Third House Surgeon. Salary £60 per annum.

LONDON FEVER HOSPITAL, Liverpool-road, N.—Assistant Resident Medical Officer. Salary £150 per annum, with residence and board.

MANCHESTER, ST. MARY'S HOSPITALS FOR WOMEN AND CHILDREN.—Two House Surgeons. Salary at rate of £50 per annum, with board and residence.

MARGARET-STREET HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST, 26, Margaret-street, W.—Honorary Physician.

NORFOLK EDUCATION COMMITTEE.—Assistant Medical Officer. Salary £250 per annum.

NORTHAMPTONSHIRE COUNTY COUNCIL EDUCATION COMMITTEE.—Temporary Assistant to School Medical Officer for six months. Salary 20 guineas per calendar month.

NORWICH, NORFOLK AND NORWICH HOSPITAL.—Assistant House Surgeon for six months. Salary £20, with board, lodging, and washing.

OLDHAM ROYAL INFIRMARY.—Senior House Surgeon and Third House Surgeon for six months. Salary £120 and £80 per annum respectively, with residence, board, and laundry.

PASSMORE EDWARDS HOSPITAL FOR WILLESDEN.—Three Members of Honorary Medical Staff.

PRINCE OF WALES'S GENERAL HOSPITAL, Tottenham, N.—Junior House Physician for six months. Salary £50 per annum, with residence, board, and laundry.

QUEEN CHARLOTTE'S LYING-IN HOSPITAL, Marylebone-road, N.W.—Assistant Resident Medical Officer for four months. Salary at rate of £50 per annum, with board, residence, and washing.

ROYAL EAR HOSPITAL, Soho.—House Surgeon. Salary £40 per annum.

ROYAL FREE HOSPITAL, Gray's Inn-road, W.C.—Female Assistant to Clinical Pathologist. Salary £50 per annum.

ROYAL LONDON OPHTHALMIC HOSPITAL, City-road, E.C.—Third House Surgeon. Salary at rate of £50 per annum, with board and residence.

ROYAL NAVAL MEDICAL SERVICE.—Twelve Commissions.

ST. MARYLEBONE INFIRMARY, Rackham-street, Ladbroke-grove, Notting Hill, W.—First Assistant Medical Officer, unmarried. Salary £150 per annum, with apartments, rations, and washing.

ST. MARYLEBONE WORKHOUSE AND HOUSELESS POOR WARDS.—Visiting Medical Officer. Salary £225 per annum.

SHEFFIELD ROYAL INFIRMARY.—Senior Assistant House Surgeon, Junior Assistant House Surgeon, and Seventh Resident Medical Officer. Salaries £70, £65, and £60 per annum respectively, with board and residence.

STOCKPORT INFIRMARY.—Junior House Surgeon. Salary £80 per annum, with board, washing, and residence.

SUNDERLAND ROYAL INFIRMARY.—Junior House Surgeon for six months. Salary £80 per annum, with board, residence, and washing.

SWANSEA GENERAL AND EYE HOSPITAL.—House Physician for six months. Salary £75 per annum, with board, washing, and attendance.

THROAT HOSPITAL, Golden-square, W.—Honorary Assistant Registrar.

WALTHAMSTOW URBAN DISTRICT COUNCIL HOSPITAL FOR INFECTIOUS DISEASE, Chingford.—Resident Medical Officer. Salary £120 per annum, with rooms and board.

WEST HAM UNION.—Second Assistant Resident Medical Officer. Salary £120 per annum.

WHITECHAPEL UNION INFIRMARY, Vallance-road, N.E.—First Assistant Resident Medical Officer. Salary £140 per annum, with rations, apartments, washing, &c.

WILTS COUNTY COUNCIL GENERAL EDUCATION COMMITTEE.—Assistant School Medical Inspector. Salary £250 per annum.

WISBECH, NORTH CAMBRIDGESHIRE HOSPITAL.—Resident Medical Officer. Salary £150 per annum, with unfurnished house.

YORK DISPENSARY.—Two Resident Medical Officers, unmarried. Salary £140 per annum, with board, lodging, and attendance.

THE Chief Inspector of Factories, Home Office, London, S.W., gives notice of vacancies as Certifying Surgeons under the Factory and Workshop Act at Long Eaton, in the county of Derby; and at Lismore, in the county of Waterford.

# Births, Marriages, and Deaths.

## BIRTHS.

NORTON.—On April 20th, at Kennington Park-road, S.E., the wife of H. Harvey Norton, L.R.C.P., M.R.C.S., of a son.

SPEIRS.—On April 20th, at Old Kent-road, S.E., the wife of T. Orr Speirs, M.B., C.M., of a daughter.

## MARRIAGES.

MCTURK—HALL.—On April 20th, at St. John's Church, Bexley, John Norman McTurk, M.D., to Isabel Margaret, youngest daughter of the late Edward Hall and Mrs. Hall, of Bentley, Hants.

PEILE—ELLIS.—On April 18th, at the Parish Church, Northfield Worcestershire, William Hall Peile, M.D., to Eleanor, second daughter of the late Herbert Ellis, Esq., and Mrs. Ellis.

WADE—LORD.—On April 19th, at the Church of St. Mary-the-Virgin, Primrose Hill, N.W., Richard Ramsden Wade, M.A., M.D., to Constance Irene, youngest daughter of the late Charles Edmund Lord.

WILLIAMS—BRITTAIN.—On April 25th, at St. Mark's Church, Sheffield, Harry John Egerton Hutchins Williams, M.D., D.P.H., M.R.C.S. Eng., L.R.C.P. Lond., to Dorothy, eldest daughter of Frederick Brittain, Esq., J.P.

## DEATHS.

CASE.—On April 25th, at Fareham, Hants, George Henry Case, aged 72.

CRAIG CHRISTIE.—On April 20th, at Bedlay, Chryston, Lanarkshire, Bernard Ramsay Craig Christie, M.D., aged 41 years.

GODWIN.—On April 24th, at West View, Warren Drive, New Brighton, Cheshire, Alfred Harold Godwin, M.R.C.S., L.R.C.P. Lond., aged 44 years.

HUGGINS.—On April 21st, at 32, Compton-terrace, Highbury, N., after a long illness, Emily Jane, the wife of Samuel T. Huggins, M.R.C.S., L.R.C.P.

KNAGGS.—On April 23rd, at 2, Bradley-lane, Huddersfield, aged 82 years, Samuel Knaggs, M.R.C.S., L.S.A.

*N.B.—A fee of 5s. is charged for the insertion of Notices of Births, Marriages, and Deaths.*

# Notes, Short Comments, and Answers to Correspondents.

## THE TITLE OF DOCTOR.

A POINT has been submitted to us for opinion in the following words:—

> "A gentleman having the degree of M.D. of the College of Physicians and Surgeons, New York (which is accepted by the Conjoint of Great Britain for Final Examination), and who has obtained the L.S.A. Dublin, whereby he is placed on the British Medical Register, wishes to know if he may use his M.D. without adding U.S.A. or P. & S. (N.Y.) when writing scientific articles for publication without infringing any ethical or professional code."

We certainly consider that the medical man in question should put the exact source of his degree after the letters M.D. Suppose, for example, that he placed his M.D. in front of his L.S.A. Dub., the natural assumption would be that his M.D. was also of Dublin origin. He is strongly advised not to call himself "M.D., U.S.A.," for this meaningless style has more than once been adopted by quacks.

## THE EPIDEMIC AMONG BEES.

THE Board of Agriculture and Fisheries desires to inform bee-keepers in Great Britain that investigations are being carried on by its scientific advisers into the causes and characteristics of the disease among bees which has now broken out in many counties, and which originally made its appearance in the Isle of Wight. The Board would be glad to receive communications from bee-keepers whose bees have been affected by the disease, and who would be willing to supply information likely to be of service in connexion with the investigations. A statement of the points upon which it is desired to obtain particulars would be sent on application. Information as to new outbreaks in districts only recently infected is especially desired. In certain cases specimens of diseased bees will be required. Correspondents are therefore requested to say whether they could send bees for examination. Bees should not be sent to the Board until asked for. Communications should be addressed to the Secretary, Board of Agriculture and Fisheries, 4, Whitehall-place, London, S.W.

## WANTED, A HEALTH RESORT.

*To the Editor of* THE LANCET.

SIR,—I should be very glad if any of your readers can advise me in the following case. A patient, married, tuberculous, wishes to live abroad in a warm climate for some time. As his means are small he is restricted in his choice. I shall be glad of advice as to suitable places, preferably not Switzerland. They do not especially desire hotel life but would prefer quiet rooms. They speak English and German, and would like not to spend more than £3 a week for both.

I am, Sir, yours faithfully,

April 18th, 1911. A.B.C.

## HOT-BEDS OF DISEASE IN CHILE.

Mr. Hewett, British Consul for the provinces of Antofagasta and Atacama, remarks, in a report just received at the Foreign Office, that the whole district is a barren mountainous desert. There is practically no vegetation except in the extreme south of Atacama. It is a country where it rarely rains. The climate, however, is not a healthy one. Nearly all newcomers are attacked with typhoid fever, the scourge of the coast. The ports are said to be hot-beds of disease, probably due to their insanitary state. Typhoid fever, however, is not confined to the seaports and coast. Many cases are brought down from the Pampas, as the higher plateaus are called, and its origin has yet to be determined. Men on sailing ships which have arrived direct from European ports without calling anywhere have been attacked by typhoid fever on arriving off the coast. Residents of long standing on the coast and Pampas are sufferers as well as newcomers.

## THE PREVENTION OF INFANT MORTALITY.

A YEAR ago we congratulated the borough of Portsmouth and Dr. A. Mearns Fraser, the medical officer of health, upon the issue of an excellent little pamphlet on infectious diseases for the use of teachers in public elementary schools. The Health Department of the borough of Portsmouth has now issued another pamphlet written by Dr. Fraser giving practical hints on the feeding and management of infants. The information as to food, clothing, bathing, and so forth, tersely written and printed in good type, is exactly the kind likely to appeal to the more intelligent among the poor. During the past 10 years out of every seven babies born alive in Portsmouth one has died before it reached the age of 12 months, and the Health Committee hopes that the advice contained in this pamphlet will help mothers to bring their babies safely in health and strength through the perilous early months of their lives.

## VARIATIONS IN THE ENGLISH CLIMATE.

IN a paper on Variations in the English Climate during the 30 years 1881–1910, read before the Royal Meteorological Society on April 19th, Mr. W. Marriott has computed the general monthly means of the observations taken during that period by the Royal Meteorological Society at its second order stations and its climatological stations regarding the pressure, temperature, humidity, rainfall, and wind, and these general means were exhibited to the meeting in the form of an interesting series of diagrams in which the variations of the various elements for each month were shown in red when above the average, and in blue when below the average for the 30 years 1881–1910. The warmest months were August, 1899, July, 1900, and July, 1901; while the coldest months were February, 1895, January, 1881, and December, 1890. During the last 14 years the temperature in October was above the average, with only one exception—viz., 1906. The years with the highest mean temperature were 1898, 1893, and 1899, and the years with the lowest temperature were 1892, 1888, and 1887. The month with the highest mean pressure was February, 1891, and that with the lowest pressure was March, 1909. On the average April is the month with the least rainfall, and October the month with the heaviest rainfall, while June has the least number of days of rain. The wettest months during the 30 years were October, 1903, and October, 1891, and the driest months were February, 1891, and April, 1893. The years with the heaviest rainfall were 1903 and 1891, and the years with the least rainfall were 1887 and 1893. The wind diagrams showed that the prevailing winds were from the south-west and west, but that in April, May, and June north-easterly winds were more pronounced than in the other months of the year.

## A CHINESE DOCTOR'S HARD LUCK.

THE following translation from a local native newspaper appeared in a recent number of the *Central China Post*. It would seem that medical practice in China is sometimes attended with drawbacks.

> "A wealthy man whose young child was sick called in the doctor, who medicined the child until it died. The father in a rage engaged ten stalwart coolies to go to the doctor's house and destroy everything in it, besides giving him a good beating into the bargain. They had not been gone very long when they returned, so the wealthy man asked how they had polished him off so soon. The stalwarts replied: 'By the time we got there a band of men sent by another patient had already smashed up the house and beaten the doctor.'"

## MEDICAL STUDY TRAVEL.

THE German Central Committee for Medical Study Travel announces for August 26th a trip to the North Sea bathing places and thence by the *Meteor* of the Hamburg-Amerika line to Norway. The trip will occupy about three weeks and will include visits to Norderney (excursions if desired to Borkum or Juist), Sylt, Wyk, Heligoland, Larvik, Sandefjord, Christiania, Holmenkollen, Voksenkollen, Næs, Romsdal, Merok, Balholmen, Gudvangen, Stalheim, Flaamthal, Myrdal, and Bergen. The price per head will be M.395, or according to choice of cabin. In view of the Fifth International Congress for Thalassotherapy a separate week's trip will be made to Kolberg and some German Ostseebäder. The following places will be visited: Kolberg, Zoppot, Hela, Pillau, Königsberg, Cranz, Kahlberg, Cadinen, Marienburg, and Danzig. The price per head will be M.85. The International Hygiene Exhibition in Dresden will be visited on June 24th and 25th. The price per head from Berlin to Dresden and back will be about M.25. Further particulars may be obtained by addressing the Deutsches Zentralkomitee für ärztliche Studienreisen, Berlin W. 9, Potsdamerstrasse, 134B.

## SCHOLL'S FOOT-EAZERS.

WE have received for inspection a pair of these appliances. They are intended for wearing inside the boot to relieve the pain and discomfort of the minor degrees of flat-foot so often associated with gouty and debilitated conditions, and they are very well designed for their purpose. They provide ease and comfort in suitable cases of flat-foot. The chief points about them are that the steel spring is strong and very elastic, that it is free in front and works upon a steel bed, that it does not slip about in the boot and does not cut into the leather or alter the shape of the sole of the boot. These are distinct advantages, for hitherto the rigid steel sole-plates used have been troublesome from not fulfilling the above conditions, and many "arch-supports" that are on the market are much too weak to be of any real assistance. We must, however, make it quite clear that the treatment of flat-foot does not consist merely in providing a suitable appliance, and that not all cases of flat-foot are benefited thereby. Worn at the instance and under the directions of a medical adviser, Scholl's Foot-eazers seem well calculated to afford ease and comfort to the wearer.

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*Handbooks for Mothers.*—Our correspondent should consult her usual medical attendant on the subject of a book for such a purpose. Among the several books which have recently been reviewed in our columns on the subject of child hygiene and nursing are Feldman's "Manual of Nursery Hygiene," Laing Gordon's "Modern Mother,"

and "Your Child's Good Health," by Dr. J. Grimshaw. Such books are of great use to district visitors, or to mothers living out of reach of medical aid, but they cannot take the place of a medical adviser.

*Ethelinda* need pay no attention to the *canard* which associates cigarette-smoking with insanity, but excess may cause injury to the throat, the eye-sight, or the heart, and is particularly harmful to the young. The medical attendant might be asked to point out the real ill-effects of over-indulgence in cigarettes.

**COMMUNICATIONS not noticed in our present issue will receive attention in our next.**

### A DIARY OF CONGRESSES.

WE shall publish this diary from time to time that our readers may have under their hands the dates of the approaching scientific Congresses. It is unnecessary to issue the lists of all these functions week by week, and we propose to make only such gatherings as will occur in the immediate future the subject of regular announcement. The following Congresses, Conferences, and Exhibitions are announced for April and May, 1911:—

April–October.—Rome Exhibition (United Italy's Jubilee).
,, 22nd–May 6th (London, Olympia).—Building Exhibition.
,, 24th–May 4th (London).—Clothing Exhibition.
,, 29th–Oct. 26th (Turin).—International Exhibition.
May 3rd–Oct. 31st (Glasgow).—Scottish Exhibition.
,, 8th–12th (London).—Seventeenth Chemists' Exhibition.
,, 12th–Oct. 31st (London, Crystal Palace).—Festival of Empire Imperial Exhibition. (Profits to King Edward VII. Hospital Fund.)
,, 13th–27th (London, Agricultural Hall).—Chemical Exhibition.
,, 18th–June 3rd (London).—Royal Naval and Military Tournament.
,, 22nd (opens) (London).—Imperial Conference.
,, 30th (The Hague).—International Congress on Opium.
,, 30th–June 2nd (London).—National Conference on the Prevention of Destitution.
,, (Paris).—International Sanitary Conference (Prevention of Plague).
,, (Washington).—Conference on the Protection of Industrial Property. (Question of False Marking of Goods.)
May–October (Dresden).—International Hygiene Exhibition.
May–October (London, Shepherd's Bush).—Coronation Exhibition.
,, ,, (London).—Earl's Court Exhibition.

# Medical Diary for the ensuing Week.

## SOCIETIES.

**ROYAL SOCIETY OF MEDICINE, 15, Cavendish-square, W. (temporary address during building of new house).**

THURSDAY.

NEUROLOGICAL SECTION (Hon. Secretaries—E. Farquhar Buzzard, Wilfred Harris), at 15, Cavendish-square, W.: at 8 P.M.

Annual Meeting.—Election of Officers and Council for Session 1911-1912.

Clinical Meeting.

*Cases:*

Dr. Fearnsides (for Dr. Head): Syringomyelia associated with Trauma.

Dr. F. E. Batten: Spondylose Rhizomélique.

Dr. Saunders (for Dr. James Taylor).—Unilateral Paralysis of Cranial Nerve.

And other Cases.

Members wishing to show Cases should communicate with Dr. Wilfred Harris, 73, Wimpole-street, W.

FRIDAY.

LARYNGOLOGICAL SECTION (Hon. Secretaries—L. Hemington Pegler, W. H. Kelson), at 11, Chandos-street, W.: at 5 P.M.

*Discussion*

On the Present Position of the Treatment of Chronic Frontal Sinus Suppuration (opened by the President, Dr. P. Watson-Williams).

Only cases and instruments illustrating treatment of frontal sinus suppuration will be shown.

**LIFE ASSURANCE MEDICAL OFFICERS' ASSOCIATION, 11, Chandos street, Cavendish-square, W.**

WEDNESDAY.—5.30 P.M., Mr. W. H. Jalland: Vaccination in Relation to Life Assurance.

**NORTH-EAST LONDON CLINICAL SOCIETY, Prince of Wales's Hospital, Tottenham, N.**

THURSDAY.—4.15 P.M., Clinical Cases. Election of Members.

**OPHTHALMOLOGICAL SOCIETY, 11, Chandos-street, Cavendish-square, W.**

THURSDAY.—8 P.M., Card Specimens will be shown by Mr. Tomlinson, Mr. Levy, and Mr. Roll. 8.30 P.M., Mr. Nettleship: New Cases of Hereditary Nystagmus.—Mr. Herbert: Interim Report on the Small Flap Sclerotomy.—Mr. Wray: The Treatment of Conical Cornea.

**WEST LONDON MEDICO-CHIRURGICAL SOCIETY, West London Hospital.**

FRIDAY.—8.30 P.M., Dr. R. Morton: Present Position of the X Ray and Radium Treatment of Malignant Disease.

## LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

**ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, W.C.**

MONDAY.—5 P.M., Mr. Shattock: Specimens Illustrating the Biology of Malignant Growths. (Museum Demonstration.)

FRIDAY.—5 P.M., Prof. Keith: Specimens Illustrating the Conditions Hydrocephaly, Microcephaly, and Oxycephaly. (Museum Demonstration.)

**MEDICAL GRADUATES' COLLEGE AND POLYCLINIC, 22, Chenies-street, W.C.**

MONDAY.—College reopens.

TUESDAY.—4 P.M., Dr. H. L. Tidy: Clinique (Medical). 5.15 P.M., Lecture:—Dr. J. S. Fairbairn: Displacements of the Uterus and Pelvic Floor.

WEDNESDAY.—4 P.M., Mr. B. R. Carling: Clinique (Surgical). 5.15 P.M., Lecture:—Dr. G. W. Hill: The Radium Treatment of Cancer in the Gullet and Stomach (illustrated with Gastroscope).

THURSDAY.—4 P.M., Dr. C. Wall: Clinique (Medical). 5.15 P.M., Mr. C. Worth: Ophthalmology in General Practice.

FRIDAY.—4 P.M., Mr. E. Clarke: Clinique (Eye).

**POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.**

MONDAY.—10 A.M., Dr. Simson: Diseases of Women. 2 P.M., Medical and Surgical Clinics. X Rays. Operations. 2.30 P.M., Mr. Dunn: Diseases of the Eye.

TUESDAY.—10 A.M., Dr. Robinson: Gynæcological Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Operations. Dr. Davis: Diseases of the Throat, Nose, and Ear. 2.30 P.M., Dr. Abraham: Diseases of the Skin.

WEDNESDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Davis: Operations of the Throat, Nose, and Ear. 2 P.M., Medical and Surgical Clinics. X Rays. Operations. Mr. B. Harman: Diseases of the Eye. 2.30 P.M., Dr. Simson: Diseases of Women.

THURSDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Operations. 2.30 P.M., Mr. Dunn: Diseases of the Eye.

FRIDAY.—10 A.M., Dr. Robinson: Gynæcological Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Operations. Dr. Davis: Diseases of the Throat, Nose, and Ear. 2.30 P.M., Dr. Abraham: Diseases of the Skin.

SATURDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Davis: Operations of the Throat, Nose, and Ear. Mr. B. Harman: Diseases of the Eye. 2 P.M., Medical and Surgical Clinics. X Rays. Operations.

**NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.**

MONDAY.—Clinics:—10 A.M., Surgical Out-patient (Mr. E. Gillespie), 2.30 P.M., Medical Out-patient (Dr. T. R. Whipham); Nose, Throat, and Ear (Mr. H. W. Carson).

TUESDAY.—Clinic:—10 A.M., Medical Out-patient (Dr. A. G. Auld). 2.30 P.M., Operations. Clinics:—Surgical (Mr. Howell Evans); Gynæcological (Dr. A. E. Giles). 3.30 P.M., Medical In-patient (Dr. A. J. Whiting).

WEDNESDAY.—Clinics:—2.30 P.M., Medical Out-patient (Dr. T. R. Whipham); Skin (Dr. G. N. Meachen); Eye (Mr. R. P. Brooks). 3 P.M., X Rays (Dr. A. H. Pirie).

THURSDAY.—2.30 P.M., Gynæcological Operations (Dr. A. E. Giles). Clinics:—Medical Out-patient (Dr. A. J. Whiting); Surgical (Mr. Carson). 3 P.M., Medical In-patient (Dr. G. P. Chappel).

FRIDAY.—2.30 P.M., Operations. Clinics:—Medical Out-patient (Dr. A. G. Auld); Surgical (Mr. E. Gillespie); Eye (Mr. R. P. Brooks). 3 P.M., Medical In-patient (Dr. R. M. Leslie).

**LONDON SCHOOL OF CLINICAL MEDICINE, Dreadnought Hospital, Greenwich.**

MONDAY.—2 P.M., Operations. 2.15 P.M., Mr. Turner: Surgery. 3.15 P.M., Sir Dyce Duckworth: Medicine. 4.30 P.M., Mr. R. Lake: Ear and Throat. Out-patient Demonstrations:—10 A.M., Surgical and Medical. 12 noon, Ear and Throat.

TUESDAY.—2 P.M., Operations. 2.15 P.M., Dr. R. Wells: Medicine. 3.15 P.M., Mr. R. Carling: Surgery. 4.15 P.M., Sir M. Morris: Diseases of the Skin. Out-patient Demonstrations:—10 A.M., Surgical and Medical. 12 noon, Skin. 4.30 P.M., Special Lecture:—Muscular Atrophies.

WEDNESDAY.—2 P.M., Operations. 2.15 P.M., Dr. F. Taylor: Medicine. 3.30 P.M., Mr. Cargill: Ophthalmology. Out-patient Demonstrations:—10 A.M., Surgical and Medical. 11 A.M., Eye.

THURSDAY.—2 P.M., Operations. 2.15 P.M., Dr. G. Rankin: Medicine. 3.15 P.M., Sir W. Bennett: Surgery. 4.30 P.M., Radiography. Out-patient Demonstrations:—10 A.M., Surgical and Medical. 12 noon, Ear and Throat.

FRIDAY.—2 P.M., Operations. 2.15 P.M., Dr. R. Bradford: Medicine. 3.15 P.M., Mr. McGavin: Surgery. Out-patient Demonstrations:—10 A.M., Surgical and Medical. 12 noon, Skin.

SATURDAY.—2 P.M., Operations. Out-patient Demonstrations:—10 A.M., Surgical and Medical. 11 A.M., Eye.

**HOSPITAL FOR SICK CHILDREN (UNIVERSITY OF LONDON), Great Ormond-street, W.C.**

TUESDAY.—5.15 P.M., Demonstration:—Mr. H. A. T. Fairbank: Deformities—Torticollis; Kyphosis; Lordosis. (Special Post-Graduate Course.)

FRIDAY.—5.15 P.M., Demonstration:—Mr. H. A. T. Fairbank: Deformities—Congenital Affections of Upper Limb; Volkmann's Contracture; Deformities resulting from Damage to Epiphyseal Lines. (Special Post-Graduate Course.)

**NATIONAL HOSPITAL FOR THE PARALYSED AND EPILEPTIC Queen-square, Bloomsbury, W.C.**

TUESDAY.—3.30 P.M., Clinical Lecture:—Dr. J. Collier: Cerebral Diplegia.

FRIDAY.—3.30 P.M., Clinical Lecture:—Dr. J. Collier: Subacute Combined Degeneration of the Spinal Cord.

CENTRAL LONDON THROAT AND EAR HOSPITAL, Gray's Inn-road, W.C.

TUESDAY.—3.45 P.M., Lecture:—Mr. J. G. French: Pharynx and Naso-pharynx.

FRIDAY—3.30 P.M., Special Lecture:—Mr. W. Stuart-Low: Nasal Obstruction—its Causes, Consequences, and Cure.

ST. JOHN'S HOSPITAL FOR DISEASES OF THE SKIN, 49, Leicester-square, W.C.

TUESDAY.—5 P.M., Mr. W. Hampson: X Rays. (Post-Graduate Lecture.)

THURSDAY.—5 P.M., Dr. W. Griffith: Parasitology and Bacteriology of the Skin. (Post-Graduate Lecture.)

ANCOATS HOSPITAL, Manchester.

THURSDAY.—4.15 P.M., Dr. E. B. Leech: Intestinal Worms and their Treatment. (Post-Graduate Clinic.)

## OPERATIONS.

### METROPOLITAN HOSPITALS.

**MONDAY** (1st).—London (2 P.M.), St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), St. George's (2 P.M.), St. Mary's (2.30 P.M.), Middlesex (1.30 P.M.), Westminster (2 P.M.), Chelsea (2 P.M.), Samaritan (Gynæcological, by Physicians, 2 P.M.), Soho-square (2 P.M.), Gt. Northern Central (2.30 P.M.), West London (2.30 P.M.), London Throat (9.30 A.M.), Royal Free (2 P.M.), Guy's (1.30 P.M.), Children, Gt. Ormond-street (9 A.M.), St. Mark's (2.30 P.M.), Central London Throat and Ear (Minor 9 A.M., Major 2 P.M.).

**TUESDAY** (2nd).—London (2 P.M.), St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), Guy's (1.30 P.M.), Middlesex (1.30 P.M.), Westminster (2 P.M.), West London (2.30 P.M.), University College (2 P.M.), St. George's (1 P.M.), St. Mary's (1 P.M.), St. Mark's (2.30 P.M.), Cancer (2 P.M.), Metropolitan (2.30 P.M.), London Throat (9.30 A.M.), Samaritan (9.30 A.M. and 2.30 P.M.), Throat, Golden-square (9.30 A.M.), Soho-square (2 P.M.), Chelsea (2 P.M.), Children, Gt. Ormond-street (9 A.M. and 2 P.M., Ophthalmic, 2 P.M.), Tottenham (2.30 P.M.), Central London Throat and Ear (Minor, 9 A.M., Major, 2 P.M.), Royal National Orthopædic (9.30 A.M. and 4 P.M.).

**WEDNESDAY** (3rd).—St. Bartholomew's (1.30 P.M.), University College (2 P.M.), Royal Free (2 P.M.), Middlesex (1.30 P.M.), Charing Cross (3 P.M.), St. Thomas's (2 P.M.), London (2 P.M.), King's College (2 P.M.), St. George's (Ophthalmic, 1 P.M.), St. Mary's (2 P.M.), St. Peter's (2 P.M.), Samaritan (9.30 A.M. and 2.30 P.M.), Gt. Northern Central (2.30 P.M.), Westminster (2 P.M.), Metropolitan (2.30 P.M.), London Throat (9.30 A.M.), Cancer (2 P.M.), Throat, Golden-square (9.30 A.M.), Guy's (1.30 P.M.), Royal Ear (2 P.M.), Children, Gt. Ormond-street (9 A.M. and 9.30 A.M., Dental, 2 P.M.), Tottenham (Ophthalmic, 2.30 P.M.), West London (2.30 P.M.), Central London Throat and Ear (Minor, 9 A.M., Major, 2 P.M.).

**THURSDAY** (4th).—St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), University College (2 P.M.), Charing Cross (3 P.M.), St. George's (1 P.M.), London (2 P.M.), King's College (2 P.M.), Middlesex (1.30 P.M.), St. Mary's (2.30 P.M.), Soho-square (2 P.M.), North-West London (2 P.M.), Gt. Northern Central (Gynæcological, 2.30 P.M.), Metropolitan (2.30 P.M.), London Throat (9.30 A.M.), Samaritan (9.30 A.M. and 2.30 P.M.), Throat, Golden-square (9.30 A.M.), Guy's (1.30 P.M.), Royal National Orthopædic (9 A.M. and 3.30 P.M.), Royal Ear (2 P.M.), Children, Gt. Ormond-street (9 A.M. and 2 P.M.), Tottenham (Gynæcological, 2.30 P.M.), West London (2.30 P.M.), Central London Throat and Ear (Minor, 9 A.M., Major, 2 P.M.).

**FRIDAY** (5th).—London (2 P.M.), St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), Guy's (1.30 P.M.), Middlesex (1.30 P.M.), Charing Cross (3 P.M.), St. George's (1 P.M.), King's College (2 P.M.), St. Mary's (2 P.M.), Ophthalmic (10 A.M.), Cancer (2 P.M.), Chelsea (2 P.M.), Gt. Northern Central (2.30 P.M.), West London (2.30 P.M.), London Throat (9.30 A.M.), Samaritan (9.30 A.M. and 2.30 P.M.), Throat, Golden-square (9.30 A.M.), Royal National Orthopædic (3.30 P.M.), Soho-square (2 P.M.), Children, Gt. Ormond-street (9 A.M., Aural, 2 P.M.), Tottenham (2.30 P.M.), St. Peter's (2 P.M.), Central London Throat and Ear (Minor. 9 A.M., Major, 2 P.M.).

**SATURDAY** (6th).—Royal Free (9 A.M.), London (2 P.M.), Middlesex (1.30 P.M.), St. Thomas's (2 P.M.), University College (9.15 A.M.), Charing Cross (2 P.M.), St. George's (1 P.M.), St. Mary's (10 A.M.), Throat, Golden-square (9.30 A.M.), Guy's (1.30 P.M.), Children, Gt. Ormond-street (9 A.M. and 9.30 A.M.), West London (2.30 P.M.).

At the Royal Eye Hospital (2 P.M.), the Royal London Ophthalmic (10 A.M.), the Royal Westminster Ophthalmic (1.30 P.M.), and the Central London Ophthalmic (2 P.M.) Hospitals operations are performed daily.

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## METEOROLOGICAL READINGS.

*(Taken daily at 8.30 a.m. by Steward's Instruments.)*

THE LANCET Office, April 26th, 1911.

| Date. | Barometer reduced to Sea Level and 32° F. | Direction of Wind. | Rain fall. | Solar Radio in Vacuo. | Maximum Temp. Shade. | Min. Temp. | Wet Bulb. | Dry Bulb. | Remarks. |
|---|---|---|---|---|---|---|---|---|---|
| April 20 | 29·97 | W. | ... | 104 | 59 | 46 | 46 | 50 | Cloudy |
| ,, 21 | 30·38 | S.W. | ... | 81 | 58 | 45 | 47 | 51 | Overcast |
| ,, 22 | 30·38 | S.W. | ... | 116 | 67 | 49 | 48 | 53 | Fine |
| ,, 23 | 30·17 | S.W. | ... | 97 | 62 | 50 | 52 | 54 | Cloudy |
| ,, 24 | 30·06 | S.W. | ... | 110 | 65 | 47 | 47 | 51 | Fine |
| ,, 25 | 29·93 | S.W. | ... | 100 | 61 | 47 | 48 | 52 | Fine |
| ,, 26 | 29·71 | W. | 0·03 | 116 | 59 | 51 | 51 | 52 | Raining |

**The following journals magazines, &c., have been received:**—Canadian Medical Association Journal, Medical Chronicle, American Journal of Obstetrics, Canadian Practitioner, Medico-Surgical Journal of the Tropics, Iron and Steel Trades Journal, Transactions of the Society of Tropical Medicine and Hygiene, Therapist, Pharmaceutical Journal, Ophthalmology, Bulletin de l'Académie Royale de Médecine de Belgique, Archivos Brasileiros de Medicina, Encyclopédie Médicale, Bulletin de l'Académie de Médecine, Quinzaine Thérapeutique, L'Hygiène, Anti-Vivisection Review, La France Médico-Thermale, Indian Medical Record, Hospital Assistant (India), Dominion Medical Monthly, Journal of Nervous and Mental Disease, La Clinique Ophtalmologique, Revue d'Hygiène, Bulletin de la Office International d'Hygiène Publique, Revue de Gynécologie.

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